

The Effect of Audit Quality on a Firm's Internal Information Environment: Evidence from Group Audits

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Abstract

We ask two research questions. First, within a conglomerate, does subsidiary audit quality affect internal information asymmetry (IIA) between top and subsidiary managers? Second, does subsidiary audit quality affect a firm's internal capital allocation efficiency? To investigate these questions, we use a unique, hand-collected group audit sample obtained from audit firm PCAOB filings. Within a conglomerate, subsidiary accounting and audit quality are paramount. We hypothesize that the participation of a low-quality subsidiary auditor will lead to greater IIA and poor internal capital allocation decisions. Our results are consistent with these predictions and extend prior audit quality research by documenting that audit quality not only affects a firm's external information environment, but also its internal information environment. Finally, our results contribute to the relatively new stream of group audit research by documenting that, in addition to external reporting, group audits have an impact on internal firm operations.

Keywords: *Group Audits, Internal Information Asymmetry, Internal Capital Allocation Efficiency*

JEL Classification: *G31, M42*

I. INTRODUCTION

In this study, we ask two research questions. First, within a conglomerate, does subsidiary audit quality affect the information asymmetry that exists between top and subsidiary managers? Second, does subsidiary audit quality affect a firm's internal capital allocation efficiency? To investigate these research questions, we use a unique hand-collected sample to identify subsidiary auditors participating in the group audits of conglomerates (i.e., audits in which multiple auditors participate). We collect this data from audit firm annual reports (PCAOB Form 2 filings) for the period 2006-2016. The auditors identified in these annual reports participated in the audits of issuers, but did not issue *any* audit opinions for *any* issuers. In short, the subsidiary auditors that we identify have experience participating in audits of publicly traded companies, but lack experience in auditing such companies at the consolidated level. Given their lack of experience, we argue that they are of lower quality. These auditors are most likely to affect the quality of accounting information at the subsidiary level. A conglomerate's top managers use subsidiary accounting information to allocate firm resources. Thus, we focus our study *within* firms and examine how the participation of low quality subsidiary auditors, in the audit of a conglomerate, affects a firm's internal information asymmetry (i.e., information asymmetry between top and subsidiary managers) and internal capital allocation efficiency.

Corporate executives must allocate firm capital to projects and subsidiaries. Firm capital is finite and top managers use information regarding a project's potential profitability to make allocation decisions. The quality of these allocation decisions are dependent upon the quality of the information used. Information transparency within the firm, therefore, is paramount (Mello, Gao, and Jia 2017). In a conglomerate, information is dispersed across subsidiaries (Chen, Martin, Roychowdhury, Wang, and Billet 2017). For example, subsidiary managers track

detailed information regarding local product demand. Top managers (e.g., CEO, CFO), on the other hand, do not have ready access to such information and to obtain it, they must communicate with subsidiary managers. The dispersion of information, and the need to collect and aggregate it, creates information asymmetry within the firm, which is further exacerbated by the rent seeking behavior of subsidiary managers (Scharfstein and Stein 2000). For example, a subsidiary manager with a desire to empire build may embellish the potential profitability of a project in order to obtain larger capital allocations.

Perhaps the most important type of information used in capital allocation decisions is financial information. For this reason, conglomerates must maintain high quality financial reporting systems, both for external and internal reporting. Prior research indicates that high quality external auditors help improve the quality of information provided to a firm's external financial statement users (Blay, Geiger, and North 2011; Dhaliwal, Hogan, Trezevant, and Wilkins 2011; Lennox and Pittman 2011; Minnis 2011). However, these studies focus on opinion issuing auditors at the consolidated reporting level and the information provided to a firm's external users. We extend this literature in two ways. First, we examine how audit quality affects internal (as opposed to external) financial reporting. Second, we examine how subsidiary (as opposed to consolidated) audit quality affects financial reporting.

Prior research suggests that it is important for top managers to have accurate information regarding subsidiary operations (Scharfstein and Stein 2000; Bernardo, Cai, and Luo 2004; Duchin and Sosyura 2013; Gallemore and Labro 2015). This suggests that both accounting and audit quality – at the subsidiary level – are important. Formally, the consolidated financial statements prepared by a conglomerate are referred to as group financial statements and audits of these statements are referred to as group audits (AICPA 2016). Often, an opinion-issuing auditor

will enlist the help of a secondary auditor(s) to complete audit procedures for a conglomerate's subsidiaries. Recently, the PCAOB has expressed concern regarding the quality of these subsidiary audits. Subsidiary auditors often complete "substantially all of the [audit] work" for a conglomerate and "...the Board's staff has observed instances in certain audits of companies in emerging markets in which the auditor did not properly coordinate the audit with another auditor" (PCAOB 2015).

Figure 1 summarizes the idea of our study and identifies its place within the larger body of audit quality research. No study, to our knowledge, has examined how audit quality in general, and subsidiary audit quality, in particular, affects a firm's internal information environment. However, prior research suggests that audit quality, at the consolidated firm level, positively affects a firm's external information environment. In addition, the group audit literature suggests that subsidiary audit quality positively affects a firm's external information environment (Glover and Wood 2014; Dee, Lulseged, and Zhang 2015; Carson, Simnett, Vanstraelen, and Trompeter 2016). Similarly, we predict that subsidiary audit quality will affect the quality of information available to top managers regarding the firm's own operations. Specifically, we posit that, in instances where a low quality subsidiary auditor participates in a firm's group audit, information asymmetry between a conglomerate's top and subsidiary managers will be higher.

Next, we argue that the quality of subsidiary accounting information should affect the quality of internal capital allocation decisions made by a firm's top managers. Prior research provides evidence consistent with this argument, documenting that investment efficiency is positively associated with financial reporting quality (Biddle and Hilary 2006; McNichols and Stubben 2008; Biddle, Hilary, and Verdi 2009; Cheng, Dhaliwal, and Zhang 2013; Shroff 2016;

Bae, Dhaliwal, and Lamoreaux 2017). These studies, however, do not consider how the participation of low-quality subsidiary auditors affects internal capital allocation efficiency. We posit that the participation of low-quality subsidiary auditors, in a group audit, will lead to poorer quality subsidiary accounting information. This, in turn, will result in top managers making poorer quality internal capital allocation decisions.

To test these predictions, we hand collect subsidiary auditor data from audit firm annual reports filed with the PCAOB (Form 2). Using the PCAOB Form 2 search tool (Form 2 is the annual report that registered audit firms are required to file with the PCAOB), we collect annual reports for audit firms that “did not issue audit reports on issuers, but played a substantial role in the preparation or furnishing of audit reports with respect to an issuer” (PCAOB 2017).¹

Appendix B provides a screen image of the PCAOB search tool. In short, we search the PCAOB Form 2 filings for what we characterize as low-quality subsidiary auditors. In these filings, subsidiary auditors identify the conglomerate for which they served as a component auditor. We hand collect key variables from these filings. Next, to identify a control sample of engagements for which a low-quality subsidiary auditor did not participate, we match our Form 2 data to Compustat firms using one-to-one matching procedure based on principal, opinion-issuing auditor and percentage of foreign revenue. This procedure is consistent with the procedure used by Dee et al. (2015), who use the same Form 2 data. We also use Compustat, Thomson Reuters, Audit Analytics, and CRSP to generate our dependent and control variables.

Our first prediction is that the participation of a low-quality subsidiary auditor will result in greater internal information asymmetry. Following Chen et al. (2017), we measure internal information asymmetry as the difference in trading returns earned by divisional and top

¹ The PCAOB’s website provides audit firm Form 2 filings starting in 2010.

managers (i.e., divisional manager returns less top manager returns). Values for this variable are generally negative (i.e., top managers earn larger returns than divisional managers; Chen et al. 2017). Less negative values indicate a “relative information advantage” for divisional managers (Chen et al. 2017). Consistent with our prediction, we find that when a low-quality auditor participates in a group audit, return differences are less negative. Next, our second prediction is that the participation of a low-quality subsidiary auditor will result in less efficient internal capital allocations. Following Cho (2015), we measure internal capital allocation efficiency, at the firm level, as the weighted average of signed, segment-level capital expenditure deviations. Consistent with this prediction, we find that internal capital allocation efficiency is negatively associated with the participation of low quality component auditors.

Collectively, our results indicate that the participation of a low quality subsidiary auditor in the audit of a conglomerate is associated with greater internal information asymmetry and poorer quality internal capital allocations. Our study makes two main contributions. First, prior research documents that audit quality positively affects the quality of information available to shareholders and debtholders. We extend and complement this research by documenting that audit quality is also associated with the quality of information available to top managers regarding their own firms’ internal operations. Second, we contribute to the relatively new stream of group audit literature. Whereas this literature has focused on the impact of group audits on a firm’s external information environment, we focus on its impact on a firm’s internal information environment. Our results, therefore, complement prior group audit studies and demonstrate that group audits also affect a firm’s internal operations.

The rest of the paper is organized as follows. In section II we discuss background, prior literature, and develop our hypotheses. In sections III and IV we discuss research design, sample selection, and results. Finally, in section V we provide concluding remarks.

II. BACKGROUND, PRIOR LITERATURE, AND HYPOTHESES

The Information Problems within a Conglomerate

A conglomerate can be viewed in the principal-agent framework, with the parent entity representing the principal and the component entities (e.g., subsidiaries) representing agents (Shroff, Verdi, and Yu 2014).² Because an agent will not always act in the best interest of a principal, the principal-agent relationship can be costly (Jensen and Meckling 1976). In a diversified firm, the parent entity allocates firm resources to its subsidiaries and then subsidiary managers invest those resources (Gertner, Scharfstein, and Stein 1994). In this relationship, there is information asymmetry. Top managers set and communicate the firm’s overall strategic objectives and are, therefore, well versed in the firm’s overall plans. However, subsidiary managers execute these plans and, unlike the parent entity’s top managers, have ready access to detailed operational information (e.g., local product demand, customer relationships; Bernardo et al. 2004; Chen et al. 2017). Monitoring subsidiary managers (i.e., the agents) can reduce agency costs (Jensen and Meckling 1976). However, factors such as “geographic dispersion, cultural and language differences, [and] differing legal systems” make monitoring difficult (Shroff et al. 2014).

Prior research provides evidence related to the information problems that exist between top and divisional managers. In poor internal information environments, divisional managers

² We use the terms ‘conglomerate’ and ‘diversified firm’ interchangeably throughout the paper.

tend to rent seek and use bargaining power to obtain greater capital budgeting allocations (Scharfstein and Stein 2000). Information problems lead to the creation of managerial contracts, but these contracts often result in corporate headquarters underinvesting in subsidiaries, especially when “the asymmetric information between headquarters and division managers is greater” (Bernardo et al. 2004). Further, in high information asymmetry environments, CEOs resort to allocating capital based on social connections with divisional managers (Duchin and Sosyura 2013). Conversely, firms with stronger internal information environments are better able to secure financial benefits (e.g., lower effective tax rates (Gallemore and Labro 2015)). Collectively these studies suggest that, in a diversified firm, it is important for top managers to have accurate financial information regarding subsidiary operations. Therefore, both accounting and audit quality, at the subsidiary level, are important. The consolidated financial statements prepared by a conglomerate are referred to as group financial statements and the audit procedures performed over those statements are referred to as a group audit.

Background: Group Audits

Formally, a group audit is the audit of financial statements that include more than one component, where the term component is defined as an “entity or business activity” that is included in an issuer’s financial statements (AICPA 2016). Examples of components include subsidiaries, geographic and business segments, divisions, and investments (Westervelt 2014). While an opinion-issuing auditor audits a conglomerate’s financial statement accounts at the consolidated level, a secondary component auditor often performs audit procedures over subsidiary financial statement accounts. For example, in 2014 Lovelock & Lewes, an audit firm located in India, audited a subsidiary of the company Cognizant Technology Solutions

Corporation while the audit firm PricewaterhouseCoopers LLP issued the audit opinion for the consolidated entity (Lovelock & Lewes 2015).

In December 2015, the PCAOB issued Release No. 2015-008, which (beginning in 2017) requires disclosure "...with respect to all other accounting firms that participated in the audit" (PCAOB 2015).³ Before issuing the final rule, the PCAOB solicited comments. Many commenters opposed the requirement, arguing that such disclosures "were not useful information" or would confuse financial statement users about "the degree of responsibility for the audit assumed by the accounting firm signing the auditor's report" (PCAOB 2015). However, the PCAOB board ultimately concluded that the disclosure of participating auditors was necessary given that companies have become increasingly global. In addition, PCAOB inspections had revealed that in some cases participating auditors complete "...most of the audit work (or, in extreme cases, substantially all of the work)" (PCAOB 2015). The board further noted "...the quality of the audit is dependent, to some degree, on the competence and integrity of the participating accounting firms" (PCAOB 2015).

In summary, there is information asymmetry between a conglomerate's top and divisional managers. Top managers rely on accounting information to monitor subsidiary operations. Prior studies have documented evidence of internal information asymmetry in conglomerates suggesting that the quality of subsidiary operational information available to top managers is important. However, it is not yet known if audit quality affects this asymmetry. Audits of these companies are referred to group audits and often involve the participation of subsidiary auditors. Therefore, we argue a study of the effects of audit quality on a conglomerate's internal

³ The effective date for this requirement is for audit opinions issued on or after June 30, 2017. Thus, this requirement was not in effect during our sample period.

information environment is best focused subsidiary audit quality. We use the setting of group audits and measure audit quality by the quality of a diversified firm's subsidiary auditor.

Hypotheses Development

No study, to our knowledge, has examined how audit quality affects a firm's internal information environment. The studies that are most directly comparable to our own are D'Mello, Gao, and Jia (2017) and Weber and Zheng (2017) who find that firm internal control failures are negatively associated with internal capital allocation efficiency. In general, there is also evidence audits in general, of a firm's consolidated financial statements, improve a firm's external information environment. For example, firms that voluntarily submit to an audit experience credit rating upgrades and lower costs of debt (Lennox and Pittman 2011; Minnis 2011). Further, evidence suggests that shareholders value the information provided by modified audit opinions (e.g., Blay et al. 2011). There is also evidence that when an auditor detects a material weakness in a firm's internal control system, the firm's credit spread increases (Dhaliwal et al. 2011). Taken together, this evidence suggests that a high quality audit, of a firm's consolidated financial statements, helps improve the quality of information provided to external financial statement users.

Similarly, there is evidence that high quality, consolidated financial statement auditors improve a firm's management information environment. For instance Dhaliwal et al. (2016), in a sample of M&A transactions, find evidence consistent with the presence of a common auditor (i.e., an auditor shared by the acquirer and target firms) facilitating the flow of target company information to acquirer managers. Similarly, Bae et al. (2017) find evidence consistent with industry expert auditors providing useful industry-level information to their clients. Together, these studies suggest that a high quality consolidated financial statement auditor helps improve

the quality of information available to top managers regarding the firm's competitors, industry trends, and potential acquisition targets.

Finally, there is evidence in the group audit literature that the participation of component auditors, in the audit of a conglomerate's subsidiary, affects overall audit quality and the quality of information provided to external financial statement users. For example, Dee et al. (2015) find that the participation of component auditors is associated with higher performance-adjusted, absolute discretionary accruals. Carson et al. (2016) find, for a sample of Australian multinational enterprises, audit quality improved for group audit engagements following a strengthening of group audit auditing standards. Finally, Glover and Wood (2014) find that when a subsidiary's financial statements are separately filed with the SEC and are included in another firm's consolidated financial statements, subsidiary financial statement quality is higher.⁴ Together, these studies suggest that the quality of audit procedures performed over subsidiary financial statement accounts affects the quality of information provided to a conglomerate's external financial statement users.

In a similar vein, we posit that subsidiary audit quality will affect the quality of information available to top managers regarding the firm's own operations. As described above, a component auditor assists a consolidated, opinion-issuing auditor in the audit of group financial statements. Some auditors serve exclusively as component auditors while others sometimes serve (in separate audit engagements) as opinion issuing auditors. We argue that the former type – a

⁴ Glover and Wood (2014) use Audit Analytics data to identify component entities. Specifically, they examine subsidiaries that have stand-alone audited financial statements (filed with the SEC), but who also have their financial statements incorporated into a parent entity's financial statements (also filed with the SEC). They compare this group to subsidiaries that have only stand-alone financial statements. They assume that if a company neither lists a parent company nor is listed as a parent company, then the company is a non-consolidated subsidiary. However, companies such as HP Inc. do not list parent entities and they are also not identified as parent entities by other SEC filers. Yet companies like HP have many subsidiaries; these subsidiaries simply do not have stand-alone financial statements.

component auditor that participates in group audits, but does not issue audit opinions for any US publicly traded companies – is of lower quality than the latter type. Ultimately, the opinion-issuing auditor is legally responsible for the audit of an issuer. Component auditors, on the other hand, have less responsibility; this smaller amount of legal responsibility has a negative effect on audit quality (Jia and Li 2016). When a low quality component auditor participates in a group audit, the quality of the audit procedures performed over subsidiary financial statement accounts will be weaker and subsidiary misstatements and internal control issues may go undetected. Because top managers rely on subsidiary financial information, lower quality subsidiary financial information will lead to greater internal information asymmetry.

Stated formally, our first hypothesis is as follows (alternative form):

H1: Internal information asymmetry is positively associated with the participation of low quality component auditors in a firm's audit engagement.

Next, a key issue faced by the top managers of a multinational corporation is how best to allocate capital to subsidiaries. Prior research documents that investment efficiency is positively associated with financial reporting quality. For instance, Biddle and Hilary (2006) find that firms' capital investments are less sensitive to cash flows when accounting quality is greater. Further, financial reporting quality constrains (encourages) investment in cash rich and unlevered (cash poor and levered) firms (Biddle et al. 2009). Cheng et al. (2013) find that firms with internal control issues under-invest (over-invest) when they are financially constrained (unconstrained). In addition, managers make less efficient capital allocations following a restatement (McNichols and Stubben 2008) and alter their investment decisions following changes in GAAP (Shroff 2016). Bae et al. (2017) find that fixed asset investment efficiency is positively associated with auditor industry expertise and size. Bae et al., however, do not

consider how the participation of low-quality subsidiary auditors affects internal capital allocation efficiency (i.e., a firm's allocation of limited capital across subsidiaries). We conjecture that the participation of low-quality participating auditors will result in poor quality subsidiary financial information. Consequently, poor quality subsidiary financial information will lead to poor internal capital allocation decisions.

Stated formally, our second hypothesis is as follows (alternative form):

H2: Internal capital allocation efficiency is negatively associated with the participation of low quality component auditors in a company's audit engagement.

III. RESEARCH DESIGN

Measure of Internal Information Asymmetry: *DIFRET*

The information asymmetry between top managers and divisional managers is typically hard to quantify and unobservable to researchers. A novel measure to capture IIA, as developed by Chen et al. (2017), is to compare the trading profitability of top managers and divisional managers on their own company's stock. The underlying assumption is that corporate insiders trade on their private information of the firm's financial performance and their trading profits, to some extent, reflect the quality of the information they possess.

To construct *DIFRET*, we first obtain all the trades executed by corporate insiders during the current fiscal year from Thomson Reuters' Insider Filing Data Feed. Then, we identify and exclude trades that are likely driven by liquidity needs and other routine reasons. Specifically, following Cohen, Malloy, and Pomorski (2012), we examine insiders' trading pattern and label the transactions as "routine" trades if an insider makes open market trades in the same calendar month over a period of at least three consecutive years. These trades are unlikely to capture insiders' private information and thus are excluded. In contrast, the remaining non-routine (or

“opportunistic”) trades likely reflect managers’ incentive to take advantage of their private information.

Following Chen et al. (2017), top managers include company executives with the following titles: chairman (role code=CB), vice chairman (VC), CEO, CFO, and Chief Operating Officer (CO), whereas divisional managers include Divisional Officers (OX), Officer of Subsidiary company (OS), and other non-top executives with role code of AV, EVP, O, OP, OT, S, SVP, VP, GP, LP, M, MD, OE, TR, GM, C, and CP.⁵ We construct two variables, *TOP_RET* and *DIV_RET*. *TOP_RET* (*DIV_RET*) captures the trading profits of top (divisional) managers for firm *i* in year *t*, measured as the average cumulative abnormal return over the six-month period after their opportunistic trades during the current fiscal year. Importantly, we measure these returns in the same period during which a low-quality component auditor participated in the audit of the issuer. *DIFRET* is measured as the difference between *TOP_RET* and *DIV_RET* ($DIFRET = DIV_RET - TOP_RET$). Larger values of *DIFRET* indicate higher internal information asymmetry, in which case top managers’ information advantage over divisional managers is weaker.

Regression Model for the Analysis of Internal Information Asymmetry

H1 predicts that firms with a low quality component auditor tend to have higher internal information asymmetry between top and component managers. We test this hypothesis by estimating the following equation (OLS model):

$$\begin{aligned}
 DIFRET_{it} = & \beta_0 + \beta_1 * LQ \text{ Component Auditor}_{it} + \beta_2 * ROA_{it} + \beta_3 * MTB_{it} + \beta_4 * SIZE_{it} \\
 & + \beta_5 * NUMSEGBUS_{it} + \beta_6 * NUMSEGCEO_{it} + \beta_7 * BIG4US_{it} \\
 & + \beta_8 * BIG4FOREIGN_{it} + \varepsilon_{it}
 \end{aligned} \tag{1}$$

⁵ Role code is collected and defined by Thomson Reuters.

The variable of interest is *LQ Component Auditor*, an indicator variable equal to one for firms that are identified in the participating auditor's Form 2, and zero otherwise. Consistent with Chen et al. (2017), the control variables include firm characteristics such as profitability (*ROA*), growth opportunities (*MTB*), the natural logarithm of firms' market value of equity (*SIZE*), the number of issuer business segments (*NUMSEGBUS*), the number of issuer geographic segments (*NUMSEGCEO*). In addition, we also include two indicator variables to proxy for principal auditor quality (*BIG4US* and *BIG4FOREIGN*) following Dee et al. (2015). Under our first hypothesis, we expect the coefficient on *LQ Component Auditor*, β_1 , to be positive.

Measure of Internal Capital Allocation Efficiency: ICAE

As was the case with IIA, it is difficult to observe or quantifiably measure internal capital market efficiency (ICAE). As Rajan, Servaes, and Zingales (2000, p.35) point out, a major obstacle has been the lack of data because “[d]ata on internal decisions made by firms are generally proprietary.” A notable exception is the mandatory segment reporting, under which a diversified firms is required to disclose sales, profitability, and investments by major segments. Although segment-level data are not as fine as division- or subsidiary-level data, it has been widely used in the internal capital market literature.

To construct internal capital allocation efficiency (*ICAE*), we follow Cho (2015) and take the following three steps. First, a segment-level capital allocation *CAPX* deviation is calculated as the ratio of segment capital expenditures to firm capital expenditures minus the ratio of segment sales to firm sales. This approach considers the reinvestment of the segment's own proceeds as passive and any capital allocation that is not proportionate to segment sales as active resource reallocation between segments. Second, a signed segment-level *CAPX* deviation is calculated as $(+1) \times \text{CAPX deviation}$ if the segment *q* is greater than its sibling segments' asset-

weighted average q , and $(-1) \times CAPX$ deviation if the segment q is not greater than its sibling segments' asset-weighted average q . Thus, a signed segment-level $CAPX$ deviation takes a more positive value if a segment with higher (lower) growth opportunities receives more (less) capital than what would be expected under passive capital allocation. Third, the firm-level measure of internal capital allocation efficiency, $ICAE$, is calculated by weight-averaging the signed $CAPX$ deviation across all segments within a firm. $ICAE$ with a more negative value indicates more value-decreasing transfers of capital from a segment with higher growth opportunities to a segment with lower opportunities.

Regression Model for the Analysis of Internal Capital Allocation Efficiency

H2 predicts that firms with a low quality component auditor tend to have lower internal capital allocation efficiency. We test this hypothesis by estimating the following equation (OLS model):

$$\begin{aligned}
 ICAE_{it} = & \gamma_0 + \gamma_1 * LQ \text{ Component Auditor}_{it} + \gamma_2 * SIZE_{it} + \gamma_3 * MTB_{it} + \gamma_4 * LEVERAGE_{it} & (2) \\
 & + \gamma_5 * CAPEX_{it} + \gamma_6 * NonCAPEX_{it} + \gamma_7 * Tangibility_{it} + \gamma_8 * Cash Holding_{it} \\
 & + \gamma_9 * Dividend_{it} + \gamma_{10} * NUMSEGBUS_{it} + \gamma_{11} * NUMSEGCEO_{it} \\
 & + \gamma_{12} * SEG Diversity_{it} + \gamma_{13} * BIG4US_{it} + \gamma_{14} * BIG4FOREIGN_{it} + \epsilon_{it}
 \end{aligned}$$

The variable of interest is *LQ Component Auditor*, an indicator variable equal to one for firms that are identified in PCAOB Form 2 filings, and zero for the matched issuers. Consistent with Cho (2015), the regression includes a group of control variables to account for the effects of firm characteristics such as growth opportunities (*MTB*), the natural logarithm of firms' market value of equity (*SIZE*), financial constraints (*LEVERAGE*, *Cash Holding*, and *Dividend*), capital expenditure at the firm level (*CAPEX* and *NonCAPEX*), asset mix (*Tangibility*). In addition, the model also includes segment characteristics such as the number of issuer business segments

(*NUMSEGBUS*), the number of issuer geographic segments (*NUMSEGCEO*), and the segment industry diversity (*SEG Diversity*), and two proxies for principal auditor quality (*BIG4US* and *BIG4FOREIGN*). Under our second hypothesis, we expect the coefficient on *LQ Component Auditor*, γ_1 , to be negative.

IV. SAMPLE AND RESULTS

Audit Firm Form 2 Filings

We hand collected data on low-quality component auditors from audit firm annual reports filed with the PCAOB (Form 2). As described in section II above, we consider a component auditor to be of low-quality if it participates in the audit of, but does not issue audit opinions for any, publicly listed firms (i.e., the opinion-issuing auditor is legally responsible for the audit of an issuer; component auditors, on the other hand, have less responsibility; Jia and Li 2016).⁶ The PCAOB website provides a Form 2 search tool including several search filters. Appendix B provides a screenshot of the search tool. To generate a list of low-quality component auditors we selected the search filter “Did not issue audit reports on issuers, but played a substantial role in the preparation or furnishing of audit reports with respect to an issuer” (PCAOB 2017). Our search resulted in 832 audit firm Form 2 filings. We manually downloaded each filing and then hand coded component auditor information from Items 1.1 (“Name of the Firm”), 1.2 (“Contact Information of the Firm”), and 4.2 (“Audit Reports with Respect to Which the Firm Played a Substantial Role during the Reporting Period”).

On an annual basis, PCAOB registered audit firms are required to file just one Form 2. As a result, if a low-quality component auditor participated in the audit of more than one publicly listed firm, a single Form 2 will contain multiple observations. In the 832 filings, we

⁶ We are referring specifically to US publicly listed firms.

identified 1,350 low-quality component auditor observations. Table 1, Panels A and B summarize the year and industry distributions associated with the audit firm Form 2 filings, respectively. Our audit firm Form 2 filings were collected for the years 2010 through 2016 (the earliest and latest year available from the PCAOB's website, respectively). In general, audit firms disclosed their activity not only in the current period, but also in prior periods. Thus, some early Form 2 filings contained data points for years as far back as 2006. However, data in the pre-2009 period is sparse, comprising only 4.38 percent of the observations extracted from the Form 2 filings (see Table 1, panel A).⁷ The number of observations extracted from the Form 2 filings is relatively stable in the years 2009 to 2015, ranging from 145 firm-year observations in 2015 to 212 observations in 2010. Next, the industry distribution in Panel B indicates that the vast majority (81.54 percent) come from the Manufacturing, Services, and Mining industries.

Sample: Internal Information Asymmetry (IIA) Analysis

Table 2, Panel A summarizes our sample selection process for our IIA analyses. After data requirements, our sample contains 181 low-quality component auditor, firm-year observations. Next, we used a one-to-one matching process – our matching criteria included identifying firms with the same principal auditor and those with the closest percentage of foreign revenue as the test observation – to construct a control sample of 181 firm-year observations for which a low-quality component auditor did not participate in the audit of an issuer (our matching procedure is consistent with Dee et al. 2015, p. 1948). This matching process is meant to ensure that differences in audit quality, between a test observation and its matched control observation, are driven by component auditors and not consolidated, opinion-issuing auditors. Finally, Table 2, Panel B provides frequency counts for our test sample. Of our 181 low-quality auditor

⁷ In general, audit firms include activity for two periods (current and prior years) in their Form 2 filings.

observations, 121 (66.9 percent) specifically performed subsidiary audit procedures; the remaining 60 observations participated in a group audit but performed other functions. Finally, 72 percent (28 percent) of our firm-year observations had a Big 4 (non-Big 4) principal (i.e., consolidated, opinion issuing) auditor.

Results: Internal Information Asymmetry (IIA)

In Table 3, we begin our IIA analyses. Panel A provides t-tests comparing our test group to our matched control group. We find evidence of greater information asymmetry (larger *DIFRET*) in the treatment group than in the control group. We also find our test sample has a larger number of geographic business segments than our control sample. Panel B provides a correlation matrix for our dependent, test, and control variables. Consistent with H1, *DIFRET* is positively correlated with *LQ Component Auditor*, although the correlation is not significant at traditional levels (p-value = 0.104).

Next, Table 4 presents the results of our multivariate tests of IIA. In column 1, we include the indicator variable *LQ Component Auditor*, which is coded 1 if a low-quality auditor participated in the audit engagement of an issuer; coded 0 otherwise. In column 2, we separately examine the type of low-quality component auditor. *LQ Component Auditor_AuditSubsidiary* is coded 1 if the component auditor disclosed that it worked specifically on the audit of an issuer's subsidiary; coded 0 otherwise. *LQ Component Auditor_OtherRole* is coded 1 if the component auditor disclosed that it performed some other, non-subsidiary related, role in the audit of an issuer; coded 0 otherwise. H1 predicts a positive association between IIA and the participation of a low-quality component auditor. Consistent with this prediction, *LQ Component Auditor* and *LQ Component Auditor_AuditSubsidiary* are positive and significant in columns 1 and 2, respectively. These results suggests that when a low-quality auditor participates in a group audit

– and specifically when a low-quality auditor performs audit work for an issuer’s subsidiary – IIA is greater. Overall, the evidence presented in Tables 3 and 4 is consistent with H1.

Sample: Internal Capital Allocation Efficiency (ICAE)

We next move to our tests of internal capital allocation efficiency (ICAE). Table 5, Panel A summarizes our sample selection process for our ICAE analyses. As in our IIA analysis, we begin constructing our sample with the 1,350 low-quality component auditor observations that we identified from audit firms’ Form 2 filings. We matched this data to Compustat, CRSP, and Audit Analytics to construct our dependent and control variables. After data requirements, our sample contains 124 low-quality component auditor, firm-year observations. Next, we used a one-to-one matching process – our matching criteria included identifying firms with the same principal auditor and those with the closest percentage of foreign revenue as the test observation – to construct a control sample of 124 firm-year observations for which a low-quality component auditor did not participate in the audit of an issuer (our matching procedure is consistent with Dee et al. 2015, p. 1948). Finally, Table 5, Panel B provides frequency counts for our test sample. Similar to the frequency counts noted in our analyses of IIA, we note that a majority of the sample (77 observations; 62.1 percent of sample) specifically performed subsidiary audit procedures; the remaining observations participated in a group audit but performed other functions. Finally, 67 percent of our firm-year observations had a Big 4 principal auditor.

Results: Internal Capital Allocation Efficiency (ICAE)

Table 6, Panel A compares our low-quality component auditor sample (Form 2 sample) to our matched control sample. Consistent with H2, we find evidence our treatment group has significantly lower internal capital allocation efficiency (*ICAE*) than the matched control group suggesting that the participation of a low-quality component auditor negatively affects internal

capital allocation. Further, we find that our test sample has less leverage (*LEVERAGE*), higher levels of *NonCAPEX*, pay dividends less often (*Dividend*), and have a greater number of geographic business segments (*NUMSEGCEO*) than our matched control sample. Panel B provides a correlation matrix for our dependent, test, and control variables. Consistent with H2, *ICAE* is negatively correlated with *LQ Component Auditor*, although the correlation is not significant at traditional levels (p-value = 0.121).

Next, in Table 7 we present the results of our multivariate analyses of the effect of low-quality component auditors on internal capital allocation efficiency. As in our IIA analyses, we present the results of two models. First, in column 1, we include the indicator variable *LQ Component Auditor*, which is coded 1 if a low-quality auditor participated in the audit engagement of an issuer; coded 0 otherwise. In column 2, we separately examine the type of low-quality component auditor. *LQ Component Auditor_AuditSubsidiary* is coded 1 if the component auditor disclosed that it worked specifically on the audit of an issuer's subsidiary; coded 0 otherwise. *LQ Component Auditor_OtherRole* is coded 1 if the component auditor disclosed that it performed some other, non-subsidiary related, role in the audit of an issuer; coded 0 otherwise. H2 predicts a negative association between *ICAE* and the participation of a low-quality component auditor. Consistent with this prediction we find that our dependent variable, *ICAE*, is negatively associated with the participation of a low-quality component auditor (column 1; *LQ Component Auditor*). In addition, this negative association is evident for instances in which the low-quality component auditor performed audit work over subsidiary financial statement accounts (column 2; *LQ Component Auditor_AuditSubsidiary*). We also find evidence that the presence of a high-quality principal (i.e., consolidated, opinion-issuing auditor)

positively affects internal capital allocation efficiency (*BIG4US* and *BIG4FOREIGN* are both significantly positive in columns 1 and 2).

Summary of Internal Information Asymmetry (IIA) and Internal Capital Allocation Efficiency (ICAE) Results

Overall, our results presented in Tables 4 and 7 provide evidence consistent with audit quality – and subsidiary audit quality, in particular – affecting a firm’s internal information environment. Group audits that involve the participation of a low-quality component auditor result in greater levels of IIA. This result is consistent with our prediction that financial information, used *within* firms, is negatively affected by low-quality auditors performing audit procedures over subsidiary financial statement accounts. It is possible that these low-quality component auditors, because of differing economic incentives, legal liability, and experience, fail to detect misstatements or control problems at the subsidiary level, ultimately resulting greater IIA (Jia and Li 2016). We also find evidence that the participation of such auditors negatively affects internal firm operations; namely, the participation of low-quality component auditors is negatively associated with capital allocation efficiency *within* the firm.

V. CONCLUSION

In this study, we ask two research questions. First, within a conglomerate, does subsidiary audit quality affect information asymmetry between top (e.g., CEO and CFO) and subsidiary managers? Second, does the participation of a low-quality subsidiary auditor negatively affect a conglomerate’s internal capital allocation efficiency? Within a conglomerate, top managers can be thought of as principals and subsidiary managers as agents. Top managers use subsidiary accounting data to assess subsidiary performance and allocate capital. Therefore, the quality of subsidiary accounting information is important.

The consolidated financial statements prepared by conglomerates are referred to as group financial statements and audits of conglomerates are referred to as group audits. Recent comments made by the PCAOB indicate concerns with the quality of audit procedures performed by subsidiary auditors (PCAOB 2015). We predict that the participation of a low quality subsidiary auditor, in the audit of a conglomerate, will increase internal information asymmetry and reduce internal capital allocation efficiency. Our results are consistent with these predictions.

We make two key contributions. First, we extend prior audit quality literature by documenting that audit quality has an impact on internal firm operations. Second, we add to the relatively new stream of group audit literature by documenting that group audits affect not only external reporting but also internal firm operations.

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APPENDIX A
Variable Definitions

Variable	Definition
<i>DIFRET</i>	A proxy for internal information asymmetry, measured as the abnormal return of divisional managers minus the abnormal return of top managers for insiders' opportunistic trades executed during the fiscal year t . ^{a, c}
<i>ICAE</i>	Proxy for internal capital allocation efficiency, constructed following Cho (2015). First, a segment-level <i>CAPX</i> deviation is calculated as [the ratio of segment capital expenditures to firm capital expenditures – the ratio of segment sales to firm sales]. Second, a signed segment-level <i>CAPX</i> deviation is calculated as $(+1) \times$ <i>CAPX</i> deviation if the segment q is greater than its sibling segments' asset-weighted average q , and $(-1) \times$ <i>CAPX</i> deviation if the segment q is not greater than its sibling segments' asset-weighted average q . Thus, a signed segment-level <i>CAPX</i> deviation takes a more positive value if a segment with higher (lower) opportunities receives more (less) capital than what would be expected under passive capital allocation. Third, the firm-level measure of capital allocation efficiency is calculated by weight-averaging the signed <i>CAPX</i> deviation across all segments within a firm. ^b
<i>LQ Component Auditor</i>	An indicator variable equal to one for firms that are identified in the participating auditor's Form 2, and zero otherwise. ^c
<i>LQ Component Auditor_AuditSubsidiary</i>	An indicator variable equal to one if the substantial role played by the participating auditor is "Audited Issuer's Subsidiary" (as indicated on Form 2), and zero otherwise. ^c
<i>LQ Component Auditor_OtherRole</i>	An indicator variable equal to one if the substantial role played by the participating auditor is not "Audited Issuer's Subsidiary" (as indicated on Form 2), and zero otherwise. ^c
<i>ROA</i>	Net income divided by the total assets. ^b
<i>MTB</i>	The book value of equity divided by the market value of equity. ^b
<i>SIZE</i>	The natural logarithm of the firm's market value of equity. ^b
<i>LEVERAGE</i>	The total liabilities divided by the total assets. ^b
<i>CAPEX</i>	The capital expenditures divided by total assets. ^b
<i>NonCAPEX</i>	An indicator variable equal one if a firm reports a positive amount of R&D or intangibles and zero otherwise. ^b
<i>Tangibility</i>	The net PP&E divided by the total assets. ^b
<i>Cash Holding</i>	The sum of cash and cash equivalents divided by the total assets. ^b
<i>Dividend</i>	An indicator variable equal one if a firm reports a positive amount of dividends for common stocks and zero otherwise. ^b
<i>NUMSEGBUS</i>	The number of business segments. ^c
<i>NUMSEGCEO</i>	The number of geographic segments. ^c

<i>SEG Diversity</i>	Segment industry diversity, measured as the number of segments with unique two-digit SIC codes divided by the total number of segments. ^b
<i>BIG4US</i>	An indicator variable equal one if the principal auditor is from a U.S. office of a Big 4 firm and zero otherwise. ^d
<i>BIG4FOREIGN</i>	An indicator variable equal one if the principal auditor is from a Big 4 foreign affiliate and zero otherwise. ^d

Data sources: ^a Thomson Reuters; ^b Compustat (Fundamentals Annual or Segments Databases); ^c PCAOB Form 2 (hand collected); ^d Audit Analytics, ^e CRSP.

APPENDIX B
PCAOB Form 2 Search Tool



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Registration, Annual and Special Reporting

[Home](#) > Search

Search for Firms by Name and/or Headquarters

Firm Name:

Headquarters Country:

... Or Search by Initial Letter of Firm Name

[A](#) [B](#) [C](#) [D](#) [E](#) [F](#) [G](#) [H](#) [I](#) [J](#) [K](#) [L](#) [M](#)
[N](#) [O](#) [P](#) [Q](#) [R](#) [S](#) [T](#) [U](#) [V](#) [W](#) [X](#) [Y](#) [Z](#)

... Or [View All Firms](#)

Find firms that filed an annual report indicating that they:

- Issued audit reports with respect to an issuer.
- Issued audit reports with respect to issuers that were employee benefit plans filing reports with the Commission on Form 11-K.
- Did not issue audit reports on issuers, but played a substantial role in the preparation or furnishing of audit reports with respect to an issuer.
- Did not issue audit reports with respect to an issuer, did not play a substantial role in the preparation or furnishing of audit reports with respect to an issuer, but issued a document with respect to financial statements of non-issuer broker-dealers either setting forth an opinion on the financial statements or asserting that no such opinion could be expressed (2014 reporting year and prior).
- Issued any audit report with respect to any broker or dealer during the reporting period (2015 reporting year and beyond).
- Did not issue audit reports with respect to any broker or dealer, played a substantial role in the preparation or furnishing of audit reports with respect to a broker or dealer during the reporting period.

FIGURE 1
Summary of Our Research Study

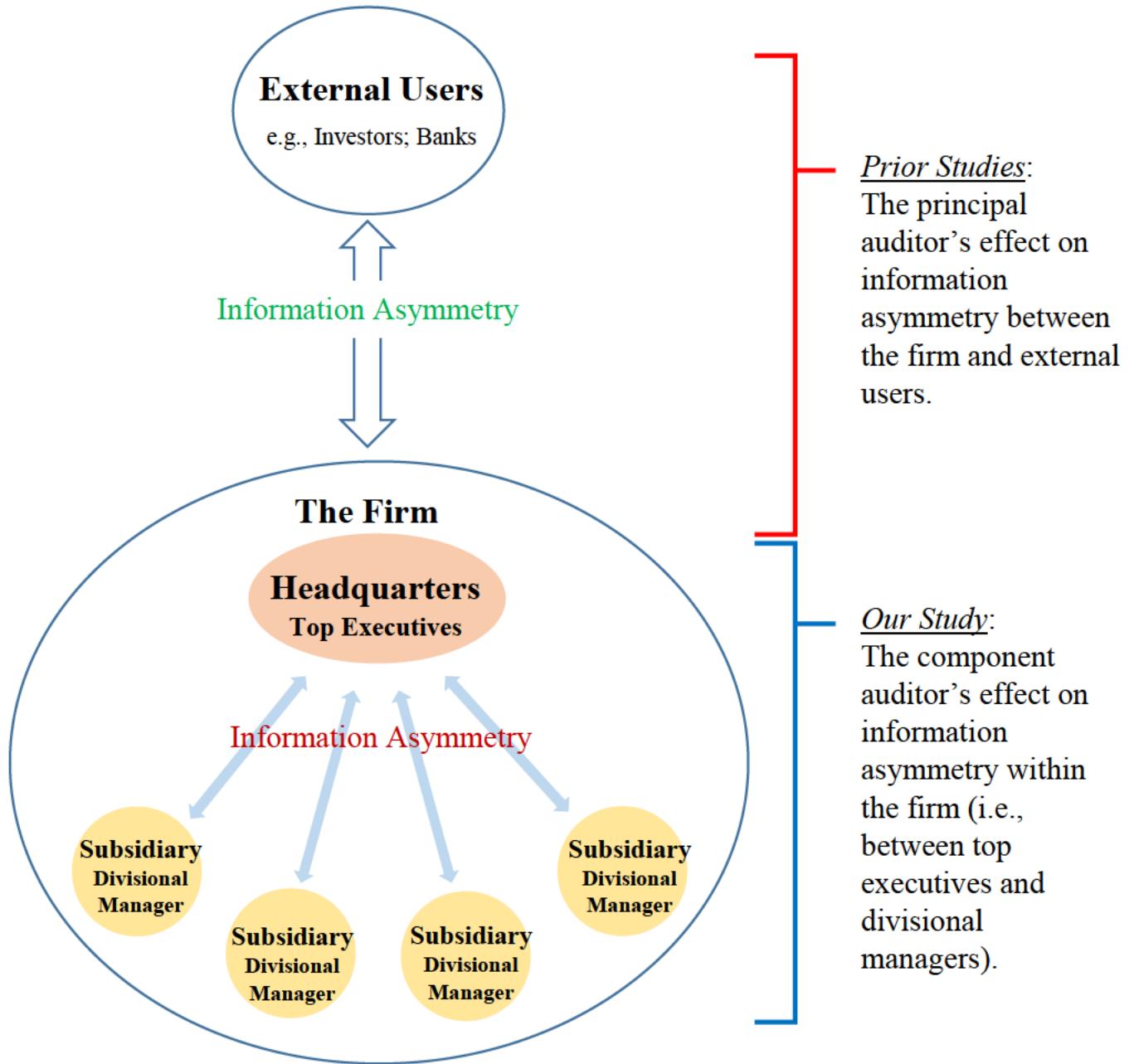


TABLE 1
Audit Firm Form 2 (PCAOB Annual Report) Filings: Year and Industry Breakdown

Panel A: Year Distribution

Year	N	% of Total
2006	2	0.15
2007	14	1.04
2008	43	3.19
2009	206	15.26
2010	212	15.70
2011	202	14.95
2012	192	14.22
2013	166	12.30
2014	164	12.15
2015	145	10.74
2016	4	0.30
Total	1,350	100.00

Panel B: Industry Distribution

SIC Code	SIC Description	N	% of Total
20-39	Manufacturing	561	41.56
70-89	Services	149	11.04
10-14	Mining	121	8.96
60-67	Finance, Insurance, Real Estate	73	5.41
40-49	Transportation & Public Utilities	73	5.41
50-51	Wholesale Trade	23	1.70
52-59	Retail Trade	11	0.81
	All Other Industries	8	0.59
	Missing SIC Data	331	24.52
	Total	1,350	100.00

This table provides year (panel A) and industry (panel B) distributions for data extracted from 832 audit firm annual reports (PCAOB Form 2) collected from the PCAOB’s website. In general, the Form 2 filings contained data for multiple years. Thus, from 832 filings, we were able to collect data for 1,350 component auditor-year observations. These 1,350 observations are the starting point for our sample selection procedures summarized in Tables 2 and 5. Since our sample is a hand-collected sample, Table 1 is presented to provide background regarding the data initially collected.

TABLE 2
Sample for Internal Information Asymmetry (IIA) Analyses

Panel A: Sample Selection for IIA Analysis

Issuers with valid CIKs identified in PCAOB Form 2 filings of audit firms that “Did not issue audit reports on issuers, but played a substantial role in the preparation or furnishings of audit reports with respect to an issuer” for 2006-2016	1,350
Less: issuers that cannot be matched to Compustat	(296)
	1,054
Less: issuers with insufficient insider trading data to calculate IIA	(850)
	204
Less: issuers without matching issuer (control sample)	(23)
Final sample for Internal Information Asymmetry (IIA) analyses	181

Panel B: Component Auditor’s Role in Issuer’s Audit for IIA Firms (n=181)

	Principal Auditor			Total
	U.S. Big 4 (n = 127; 70%)	Foreign Big 4 (n = 3; 2%)	Non-Big 4 (n = 51; 28%)	
Audited Issuer’s Subsidiary	76	3	42	121
	59.8%	100.0%	82.4%	66.9%
Other (e.g., Subcontractor Assisted Principal Auditor)	51	0	9	60
	40.2%	0.0%	17.6%	33.1%

Panel A summarizes our sample selection process for our internal information asymmetry analyses. Panel B cross-tabulates the frequency of component auditor type with consolidated auditor type. “Audited Issuer’s Subsidiary” identifies component auditors who, in their PCAOB annual report (Form 2), said that they specifically audited an issuer’s subsidiary. “Other” identifies all remaining observations. For example, 47/60 observations in this group said they served as subcontractors assisting the principal auditor. In Table 4, we separately examine these subcategories of component auditors.

TABLE 3
Descriptive Statistics and Correlation Matrix for Internal Information Asymmetry (IIA) Analyses

Panel A: IIA Descriptive Statistics

Variable	LQ Component Auditor Sample (N = 181)		Matched Sample (N = 181)		Diff. in Means	
	Mean	Median	Mean	Median	Diff.	t-stat.
<i>DIFRET</i>	-0.009	0.003	-0.063	-0.016	0.055	1.63*
<i>ROA</i>	0.038	0.057	0.012	0.042	0.026	1.68*
<i>MTB</i>	2.572	2.198	3.676	2.826	-1.104	-1.31
<i>SIZE</i>	7.641	7.404	7.333	7.145	0.308	1.50
<i>NUMSEGBUS</i>	2.061	1.000	1.928	1.000	0.133	0.72
<i>NUMSEGCEO</i>	5.066	4.000	4.116	4.000	0.950	4.08***

Panel B: IIA Correlation Matrix

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
(1) <i>DIFRET</i>	1.00							
(2) <i>LQ Component Auditor</i>	0.09	1.00						
(3) <i>ROA</i>	0.00	0.09	1.00					
(4) <i>MTB</i>	0.02	-0.07	0.09	1.00				
(5) <i>SIZE</i>	0.00	0.08	0.41	0.14	1.00			
(6) <i>NUMSEGBUS</i>	0.03	0.04	0.18	-0.01	0.34	1.00		
(7) <i>NUMSEGCEO</i>	0.04	0.21	-0.01	-0.01	0.04	0.11	1.00	
(8) <i>BIG4US</i>	-0.01	0.00	0.24	0.00	0.50	0.09	0.02	1.00
(9) <i>BIG4FOREIGN</i>	0.00	0.00	0.00	0.02	-0.03	0.00	0.10	-0.20

All variables are defined in Appendix A. Note, in Panel A, we exclude the variables *BIG4US* and *BIG4FOREIGN* because our matching procedure required that our test sample (“Form 2 Sample”) and our control sample (“Matched Sample”) have the same principal auditor; thus, there is no potential for difference between the test and control samples for these variables. In addition, we report frequency distributions for these variables in Table 2, Panel B. In Panel B, significant correlations (p-value ≤ 0.10) are listed in bold font.

TABLE 4
Does Subsidiary Audit Quality Affect Internal Information Asymmetry (IIA)?

	Dependent Variable = <i>DIFRET</i>	
	(1)	(2)
	Coefficient (t-statistic)	
<i>Constant</i>	-0.073 (-1.18)	-0.073 (-1.16)
<i>LQ Component Auditor (prediction: +)</i>	0.053** (1.75)	
<i>LQ Component Auditor_AuditSubsidiary (prediction: +)</i>		0.053** (1.68)
<i>LQ Component Auditor_OtherRole (prediction: ?)</i>		0.052 (1.35)
<i>ROA</i>	-0.008 (-0.11)	-0.009 (-0.11)
<i>MTB</i>	0.001 (0.71)	0.001 (0.69)
<i>SIZE</i>	-0.002 (-0.16)	-0.002 (-0.15)
<i>NUMSEGBUS</i>	0.005 (0.38)	0.005 (0.39)
<i>NUMSEGCEO</i>	0.003 (0.40)	0.003 (0.39)
<i>BIG4US</i>	-0.004 (-0.11)	-0.004 (-0.11)
<i>BIG4FOREIGN</i>	-0.014 (-0.30)	-0.014 (-0.30)
Observations	362	362
Adjusted-R ²	0.009	0.009

This table presents the results from estimating the following model (OLS, robust standard errors):

$$DIFRET_{it} = \beta_0 + \beta_1 * LQ\ Component\ Auditor_{it} + Controls + \epsilon_{it} \quad (1).$$

The sample used is summarized in Table 2, panel A. *DIFRET* represents the returns of divisional managers less returns of top managers; greater values indicate greater internal information asymmetry (IIA). *LQ Component Auditor* is an indicator variable coded 1 if a low-quality component auditor participated in the audit of the firm's financial statements; coded 0 otherwise. *LQ Component Auditor_AuditSubsidiary* (*LQ Component Auditor_OtherRole*) is coded 1 if a low-quality component auditor worked specifically on the audit of a subsidiary (did not work on the audit of a subsidiary, but played some other role in the audit of an issuer). ***, **, * significant at 0.01, 0.05, and 0.10 levels, respectively (one-tail tests for signed predictions, two-tail tests otherwise). All variables are defined in the Appendix A.

TABLE 5
Sample for Internal Capital Allocation Efficiency (ICAE) Analyses

Panel A: Sample Selection for ICAE Analysis

Issuers with valid CIKs identified in PCAOB Form 2 filings of audit firms that “Did not issue audit reports on issuers, but played a substantial role in the preparation or furnishings of audit reports with respect to an issuer” for 2010-2016	1,350
Less: issuers that cannot be matched to Compustat	(296)
	1,054
Less: issuers that have no segment data	(181)
	873
Less: issuers that are reported as single-segment firms	(472)
	401
Less: issuers with insufficient segment data to calculate ICAE	(237)
	164
Less: issuers that fail to find a matching issuer (control sample)	(40)
Final samples for Internal Capital Allocation Efficiency (ICAE) analyses	124

Panel B: Participating Auditor’s Role in Issuer’s Audit for ICAE Firms (n=124)

	Principal Auditor			Total
	U.S. Big 4 (n = 56; 45%)	Foreign Big 4 (n = 27; 22%)	Non-Big 4 (n = 41; 33%)	
Audited Issuer’s Subsidiary	43	6	28	77
	76.8%	22.2%	68.3%	62.1%
Other (e.g., Subcontractor Assisted Principal Auditor)	13	21	13	47
	23.2%	77.8%	31.7%	37.9%

Panel A summarizes our sample selection process for our internal capital allocation efficiency analyses. Panel B cross-tabulates the frequency of component auditor type with consolidated auditor type. “Audited Issuer’s Subsidiary” identifies component auditors who, in their PCAOB annual report (Form 2), said that they specifically audited an issuer’s subsidiary. “Other” identifies all remaining observations. For example, 29/47 observations in this group said they served as subcontractors assisting the principal auditor. In Table 7, we separately examine these subcategories of component auditors.

TABLE 6
Descriptive Statistics and Correlation Matrix for Internal Capital Allocation Efficiency (ICAE) Analyses

Panel A: ICAE Descriptive Statistics

Variable	Form 2 Sample (N = 124)		Matched Sample (N = 124)		Diff. in Means	
	Mean	Median	Mean	Median	Diff.	t-stat.
<i>ICAE</i>	-0.056	-0.003	0.013	-0.010	-0.069	-1.56*
<i>SIZE</i>	6.670	6.956	6.427	6.651	0.242	0.77
<i>MTB</i>	1.988	1.492	1.997	1.533	-0.009	-0.03
<i>LEVERAGE</i>	0.505	0.532	0.571	0.548	-0.066	-2.32**
<i>CAPEX</i>	0.202	0.181	0.199	0.186	0.003	0.19
<i>NonCAPEX</i>	0.718	1.000	0.524	1.000	0.194	3.19***
<i>Tangibility</i>	0.302	0.222	0.291	0.212	0.011	0.38
<i>Cash Holding</i>	0.118	0.106	0.140	0.094	-0.022	-1.40
<i>Dividend</i>	0.403	0.000	0.532	1.000	-0.129	-2.05**
<i>NUMSEGBUS</i>	3.766	3.000	3.742	4.000	0.024	0.12
<i>NUMSEGCEO</i>	5.250	4.500	4.040	3.000	1.210	3.20***
<i>SEGDiversity</i>	0.662	0.600	0.630	0.500	0.032	0.95

Panel B: ICAE Correlation Matrix

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
(1) <i>ICAE</i>	1.00													
(2) <i>LQ Component Auditor</i>	-0.10	1.00												
(3) <i>SIZE</i>	-0.09	0.05	1.00											
(4) <i>MTB</i>	-0.03	0.00	0.28	1.00										
(5) <i>LEVERAGE</i>	0.10	-0.15	-0.16	-0.09	1.00									
(6) <i>CAPEX</i>	-0.14	0.01	0.02	0.08	-0.09	1.00								
(7) <i>NonCAPEX</i>	0.11	0.20	0.09	0.00	0.03	-0.04	1.00							
(8) <i>Tangibility</i>	0.12	0.02	0.08	-0.04	0.05	-0.36	-0.44	1.00						
(9) <i>Cash Holding</i>	-0.08	-0.09	-0.08	-0.05	-0.33	0.17	-0.04	-0.27	1.00					
(10) <i>Dividend</i>	0.07	-0.13	0.48	0.24	-0.10	-0.06	0.15	-0.06	0.03	1.00				
(11) <i>NUMSEGBUS</i>	0.04	0.01	0.33	0.03	0.05	-0.10	0.14	0.05	-0.12	0.32	1.00			
(12) <i>NUMSEGCEO</i>	0.03	0.20	0.16	0.02	-0.11	-0.07	0.10	-0.02	0.03	0.06	0.16	1.00		
(13) <i>SEGDiversity</i>	-0.03	0.06	-0.01	-0.09	-0.08	0.08	0.05	-0.25	0.12	0.04	-0.12	-0.07	1.00	
(14) <i>BIG4US</i>	0.02	0.00	0.48	0.20	-0.06	0.10	0.14	-0.18	-0.04	0.14	0.12	0.22	-0.05	1.00
(15) <i>BIG4FOREIGN</i>	0.07	0.00	-0.02	-0.22	-0.05	-0.03	-0.29	0.46	-0.02	-0.12	-0.09	-0.10	-0.03	-0.48

All variables are defined in Appendix A. Note, in Panel A, we exclude the variables *BIG4US* and *BIG4FOREIGN* because our matching procedure required that our test sample (“Form 2 Sample”) and our control sample (“Matched Sample”) have the same principal auditor; thus, there is no potential for difference between the test and control samples for these variables. In addition, we report frequency distributions for these variables in Table 5, Panel B. In Panel B, significant correlations (p -value ≤ 0.10) are listed in bold font.

TABLE 7
Does Subsidiary Audit Quality Affect Internal Capital Allocation Efficiency (ICAE)?

	Dependent Variable = ICAE	
	(1)	(2)
	Coefficient (t-statistic)	
<i>Constant</i>	-0.129 (-0.75)	-0.087 (-0.56)
<i>LQ Component Auditor (prediction: -)</i>	-0.085* (-1.57)	
<i>LQ Component Auditor_AuditSubsidiary (prediction: -)</i>		-0.124** (-1.83)
<i>LQ Component Auditor_OtherRole (prediction: ?)</i>		-0.018 (-0.37)
<i>SIZE</i>	-0.049** (-2.21)	-0.053** (-2.29)
<i>MTB</i>	0.005 (0.71)	0.006 (0.80)
<i>LEVERAGE</i>	0.068 (0.66)	0.055 (0.54)
<i>CAPEX</i>	-0.134 (-0.44)	-0.145 (-0.47)
<i>NonCAPEX</i>	0.172* (1.92)	0.168* (1.92)
<i>Tangibility</i>	0.310 (1.41)	0.283 (1.34)
<i>Cash Holding</i>	-0.073 (-0.35)	-0.100 (-0.48)
<i>Dividend</i>	0.117* (1.68)	0.122* (1.74)
<i>NUMSEGBUS</i>	0.007 (0.82)	0.008 (0.82)
<i>NUMSEGCEO</i>	0.006 (1.01)	0.006 (1.06)
<i>SEGDiversity</i>	0.058 (0.60)	0.051 (0.55)
<i>BIG4US</i>	0.177** (2.07)	0.190** (2.13)
<i>BIG4FOREIGN</i>	0.167* (1.94)	0.154* (1.84)
Observations	248	248
Adjusted-R ²	0.139	0.148

This table presents the results from estimating the following model (OLS, robust standard errors):

$$ICAE_{it} = \gamma_0 + \gamma_1 * LQ\ Component\ Auditor_{it} + Controls + \varepsilon_{it} \quad (2).$$

The sample used is summarized in Table 5, panel A. *ICAE* is a firm-level measure of internal capital allocation efficiency measured as the weighted average of signed, segment-level capital expenditure deviations. *LQ Component Auditor* is an indicator variable coded 1 if a low-quality component auditor participated in the audit of the firm's financial statements; coded 0 otherwise. *LQ Component Auditor_AuditSubsidiary* (*LQ Component*

Auditor_OtherRole) is coded 1 if a low-quality component auditor worked specifically on the audit of a subsidiary (did not work on the audit of a subsidiary, but played some other role in the audit of an issuer). ***, **, * significant at 0.01, 0.05, and 0.10 levels, respectively (one-tail tests for signed predictions, two-tail tests otherwise). All variables are defined in the Appendix A.