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The Impact of CEO/CFO Outside Directorships on Auditor Selection and Audit Quality

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The Impact of CEO/CFO Outside Directorships on Auditor Selection and Audit Quality

Abstract: We examine whether Chief Executive Officer/Chief Financial Officer (CEO/CFO) outside directorships and resulting network ties to auditors affect auditor selection decisions and subsequent audit quality. The network ties arise when the CEO/CFO of a firm (*home* firm) serves as an outside director of another firm that hires an auditor (*connected* auditor). Using a sample of firms that switch auditors over the period 2003-2012, we find that home firms are more likely to appoint connected auditors. We also find that home firms hiring connected auditors experience a significant decline in subsequent audit quality, compared to those hiring non-connected auditors. Specifically, the likelihood of misstatements, the propensity to meet or beat earnings benchmarks, and the magnitude of absolute discretionary accruals increase after home firms appoint connected auditors, compared to other firms switching to non-connected auditors. We further show that the negative effect of hiring connected auditors on subsequent audit quality is more pronounced when the connection is via the same auditor office or audit committee membership.

Key Words: CEO/CFO outside directorship, auditor selection, audit quality, auditor independence

JEL Classification: G34, M40, M42

1. Introduction

This study examines whether Chief Executive Officer or Chief Financial Officer (CEO/CFO) outside directorships and resulting network ties to auditors affect auditor selection decisions, and how the appointment of such networked auditors influences subsequent audit quality. Senior executives of other firms are preferred candidates for independent outside directors because of their strategic leadership and finance/accounting expertise. Despite this preference, there is little consensus on whether such outside directorships are beneficial or harmful to their home firms. While some studies suggest that executives' outside board directorship is related to managerial opportunism and entrenchment (Davis 1991; Zajac and Westphal 1996), others argue that it can enhance the home firm's ability to obtain critical information and resources (Bacon and Brown 1975; Fahlenbrach et al. 2010).¹ Our study provides a unique setting to test these two different views in the context of audits. On the one hand, executives may prefer to hire their networked auditors because their pre-existing relationship can potentially lower uncertainty related to auditor switch and thus improve audit quality. On the other hand, executives may use the connection to appoint a "cozy" auditor and to exert influence over auditor independence. Therefore, it is an open empirical question how executives' network ties to auditors through outside directorships affect auditor selection decisions and subsequent audit quality.

Prior studies examine the effect of network ties between executives and auditors via common education or prior employment at audit firms on audit outcomes (e.g., Menon and Williams 2004; Dhaliwal et al. 2015; Guan et al. 2016).² Distinct from these studies, we focus on a network tie

¹ Geletkanycz and Boyd (2011) and Ruigrok et al. (2006) call these two views "the agency view" and "the embeddedness view," respectively. We follow these studies and use the same terms.

² While these studies examine the effect of network ties that were developed in the past, our study focuses on *current* and *ongoing* ties that can affect auditors' economic incentives. When auditors challenge a client's management on

that arises when the CEO/CFO of a firm (*home* firm) serves as an outside director of another firm (*connected* firm) that hires an auditor (*connected* auditor).³ We call this relationship CEO/CFO-auditor interlocks.⁴ A network tie is naturally established when the CEO/CFO serves on the audit committee (AC) of the connected firm because of the interactions with the auditor for accounting and auditing issues. Even when the CEO/CFO does not serve on the AC, a network tie can be built because of common acquaintance with AC members and the auditor's liaison with the board of directors (BOD) to discuss important agendas (Cohen et al. 2007). While the CEO/CFO outside directorship provides an important opportunity to learn about an auditor and to build a connection, the implication of such a connection for auditor appointment decision and subsequent audit outcome has not been explored in prior studies.

Extant literature proposes two theories, embeddedness and agency views, with respect to executive outside directorship and its contribution to the home firms (e.g., Ruigrok et al. 2006; Shropshire 2010; Geletkanycz and Boyd 2011). Under the embeddedness view, the CEO/CFOs with outside directorships may prefer to hire a connected auditor through their network ties because their familiarity with the auditor can reduce the uncertainty of an incoming auditor and

financial reporting issues, they bear a risk of losing a client. Whereas auditors in our setting take a risk of losing *more than one* client (home and connected firms), such imminent economic pressures do not exist in the setting of audit firm alumni or school ties.

³ Among senior executives, we examine the interlocking of CEO/CFO for the following reasons. First, the Sarbanes-Oxley Act of 2002 recognizes the role of the two executives in financial reporting by requiring them to certify the fairness of their financial statements. Second, the two executives still influence auditor selection decisions, even though SOX mandates that the audit committee (AC) be directly responsible for appointment and oversight of auditors (Cohen et al. 2010a; Fiolleau et al. 2013; Dhaliwal et al. 2015) and that auditors also perceive that CEO/CFOs have powers to switch auditors with little friction with the AC (Gendron and Bedard 2006). Third, the AC often interacts with the CEO/CFO. CFOs attend most AC meetings, and in some cases, CEOs also attend the meetings. Thus, the two executives have more influence over audit-related matters and financial reporting than other senior executives.

⁴ We use the terms CEO/CFO-auditor *interlocks*, *network ties*, or *connections* interchangeably to indicate this relationship. Since the identity of the audit engagement partner is not publicly disclosed in the U.S. during our sample period, we are unable to measure network ties of audit partners. Due to this drawback, we operationalize the network ties between CEO/CFOs and auditors at the firm level (in lieu of the partner level) through outside directorships.

improve communication and working relationship.⁵ Even under the agency view, the CEO/CFOs can still prefer hiring a connected auditor because, by appointing the connected auditor, they could influence auditor hiring, retention, firing, and compensation decisions in both home and connected firms. This, in turn, could allow them to exercise a greater bargaining power over the connected auditor and to increase the chances of more lenient audit judgments. Taken together, we predict that the presence of CEO/CFO-auditor interlocks will increase the likelihood that the home firm hires a connected auditor when the firm switches its auditor.

It is *ex ante* unclear, however, in which direction hiring a connected auditor will affect the subsequent audit quality for the home firm. The embeddedness view implies that it has a positive impact on audit quality because appointing an acquainted auditor improves communication and facilitates information transfers between client and auditor. In contrast, the agency view suggests that the interlocking relationship can pose a threat to auditor independence due to the increased power of CEO/CFOs over the connected auditor, which can negatively affect subsequent audit quality. Collectively, we hypothesize the impact of an appointment of a connected auditor on subsequent audit quality as two competing predictions.

To test these predictions empirically, we first identify auditor switching firms from *Audit Analytics* database and then collect data for CEO/CFOs' board interlocks from *BoardEx* database, which covers most public firms in the U.S. Our sample consists of 597 firms that switched to Big 4 auditors over the period 2003–2012. Consistent with our prediction, we find that firms whose CEO/CFOs have network ties via outside directorships are more likely to appoint connected auditors. For instance, PricewaterhouseCoopers (PwC) is more likely to be appointed as a new

⁵ Furthermore, the likelihood of appointing a connected auditor can be higher when the auditor exhibits superior audit quality at the connected firm. We examine this possibility in a later section.

auditor for firms whose CEO/CFO serves as an outside director of another firm that currently hires PwC, relative to other Big 4 firms. We find similar results for other Big 4 auditors. Next, using a difference-in-differences research design, we find that hiring the connect auditors impairs the subsequent audit quality. Specifically, home firms hiring the connected auditors are more likely to misstate their financial statements, meet or beat analysts' consensus forecasts and zero earnings, and report greater absolute discretionary accruals, subsequent to auditor changes, than firms switching to non-connected auditors. These findings remain unchanged even when we use the propensity score matching approach to control for potential self-selection bias. Collectively, our findings suggest that CEO/CFO outside directorships increase the likelihood of hiring a connected auditor, thereby resulting in a deterioration in audit quality. Furthermore, our results show that the impaired audit quality is more pronounced when the ties are developed through either the same office or AC membership than when the ties are developed through the same audit firm (but not the same office) and merely board interlocks. Finally, we provide evidence that the connected auditors receive abnormally higher fees from *both* home and connected firms after the home firm hires the connected auditors.

Our study contributes to the literature in several ways. First, this study adds to the literature on the effects of top executives' outside directorship on home firms. While existing studies examine this issue in the areas of firm performance, corporate governance, CEO compensation, performance of mergers, and sensitivity of CEO turnover-to-performance (e.g., Geletkanycz et al. 2001; Fich 2005; Balsmeier et al. 2011; Geletkanycz and Boyd 2011; El-Khatib et al. 2015), to the best of our knowledge, no research has explored the effect in the context of auditing. Our results indicate that hiring a connected auditor via the executives' outside directorship can undermine external monitoring, which is a potential cost to the home firm.

Second, while prior studies examine the determinants of hiring a Big 4 or industry specialist auditor, a scarce amount of research has explored auditor choice decisions among Big 4 auditors. Our study contributes to the literature by documenting that CEO/CFO-auditor network ties through outside directorships significantly affect auditor selections within Big 4 auditors.

Third, our study extends audit research by examining the effect of CEO/CFO-auditor interlocks on audit quality, which is notably absent in the literature. The literature on the role of networks in financial reporting is growing, but related audit research has focused only on the effects of audit firm alumni affiliation (e.g., Lennox 2005), AC director-CEO ties (e.g., Bruynseels and Cardinaels 2014), or AC director-auditor interlocks (Chen et al. 2014). Moreover, the mixed evidence from these studies highlights the need for further research.⁶ Our study complements prior studies by documenting that CEO/CFOs influence auditor selection decisions to hire connected auditors and that hiring such auditors impairs subsequent audit quality.

Our study provides regulatory insights into CEO/CFO-auditor interlocks. While the Sarbanes-Oxley Act of 2002 (SOX) requires a one-year cooling-off period before an audit firm employee accepts an executive position at a former client, our findings suggest that another form of client-auditor ties can also impair audit quality. Given the downside of the CEO/CFO-auditor interlocks on audit quality, regulators may consider developing mechanisms that discourage clients' opportunistic auditor switches, such as mandated disclosure of any existing CEO/CFO-auditor interlocks, especially when the relationship is via AC membership or the same audit office.

In Section 2, we discuss prior literature and develop hypotheses. Section 3 describes the

⁶ For example, while Lennox (2005) suggests that audit quality is impaired when client executives are affiliated with auditors, Bruynseels and Cardinaels (2014) find that professional and school ties between CEO and AC directors do not hamper the quality of the AC's oversight. Chen et al. (2014) also find that investors' perception of earnings quality measured by earnings response coefficients increases with AC director-auditor interlocks.

sample selection and research design. We discuss the empirical results in Section 4 and conclude in Section 5.

2. Literature review and hypotheses development

2.1. Social and professional networks of corporate stakeholders

Social capital theory predicts that social and professional ties between individuals affect their behavior and economic outcomes (e.g., Granovetter 2005). A stream of literature examines various ties between executives and non-executive directors and generally finds that the connections result in weak corporate governance and poor financial reporting quality (Hwang and Kim 2009; Fracassi and Tate 2012; Bruynseels and Cardinaels 2014).⁷ Another line of research examines social networks with external parties, such as analysts and fund managers. Contrary to above-mentioned studies, these studies find that such social connections improve the external parties' decision making by facilitating efficient information transfers (Cohen et al. 2008; Cohen et al. 2010b; Engelberg et al. 2012).⁸

In audit research, while several studies explore how network ties between client firm executives and auditors affect audit outcomes, the evidence concentrates on the effect of audit firm alumni affiliation, where an audit firm employee joins one of the auditor's client firms (*alma mater* affiliation). For example, Lennox (2005) and Menon and Williams (2004) find that firms with *alma*

⁷ Bruynseels and Cardinaels (2014) find that, while professional and school ties between CEOs and AC members do not hamper the AC's oversight quality, nonprofessional social ties such as shared leisure clubs lead to greater earnings management. Fracassi and Tate (2012) find that ties between board members and CEO weaken the monitoring effectiveness and reduce firm value. Hwang and Kim (2009) document that CEOs with socially connected boards receive higher compensation and exhibit weaker pay-performance and turnover-performance sensitivities.

⁸ For example, Cohen et al. (2008) find that fund managers with school ties place greater bets on connected firms and their portfolios of connected firms exhibit superior performance. Engelberg et al. (2012) show that school or professional ties between managers of banks and borrowing firms improve information flow and lending efficiency. Cohen et al. (2010b) find that analysts with school ties have higher performance of stock recommendation.

mater officers are less likely to receive going concern opinions and tend to report higher absolute discretionary accruals, respectively, consistent with the view that auditor alumni affiliation harms auditor independence.⁹ Lennox and Park (2007) show that firms with affiliated officers are more likely to hire their *alma mater* as an auditor in the pre-SOX period and that effective AC moderates this likelihood. Extending the sample to the post-SOX period, Dhaliwal et al. (2015) report that affiliated officers continue to affect the appointment of their *alma mater* but show that such hiring does not lead to impaired auditor independence in the post-SOX period. Guan et al. (2016) examine how school ties between auditors and client executives affect audit quality and audit fees, using Chinese data where the identity of signing audit partners is disclosed. They find that the school ties impair audit quality while increasing audit fees, suggesting that Chinese auditors tend to compromise their independence in the presence of school ties.

An alternative channel for client-auditor networks is director/executive-auditor interlocks, as in our setting. Recently, Lennox and Yu (2016) find that firms tend to hire audit firms with whom directors and executives of home firms are acquainted through their service on the boards of other firms and that the tenure of auditors hired from such connections is longer than that of other auditors.¹⁰ Relying on the interlocks between AC directors and auditors, Chen et al. (2014)

⁹ On the contrary, Geiger et al. (2008) find a positive market reaction to firms hiring *alma mater* officers, suggesting that this hiring practice is not necessarily value-destroying. Furthermore, Naiker and Sharma (2009) and Naiker et al. (2013) find that the presence of a former audit partner on the AC reduces internal control deficiencies and earnings management, and non-audit services procured from the auditor, respectively, suggesting that AC monitoring improves with the presence of an *alma mater* independent director.

¹⁰ Lennox and Yu (2016) find that hiring those auditors is weakly associated with higher audit quality. We note that the roles and incentives of *outside directors* are quite different from those of *executives*. Executives are directly responsible for firm performance, while outside directors' main responsibilities are monitoring and advising executives. Lennox and Yu (2016)'s weak results on audit quality may come from examining the interlocks of executives and outside directors together, despite their different roles and incentives. Moreover, prior studies find contrasting effects of auditors' professional ties to executives (Lennox 2005) and to outside directors (Chen et al. 2014) on audit quality. Our additional analysis, discussed in the later section, also indicates that AC-auditor ties through outside directorship do not affect auditor choice decisions or audit quality. Given that CEO/CFOs and outside directors take different roles and incentives, we believe that our focus on CEO/CFO-auditor network ties better identifies top

find that earnings response coefficients (ERCs) are higher for firms with the interlocks, suggesting that investors' perception of earnings quality increases with AC director-auditor interlocks.

2.2. Embeddedness and agency views

There are two theories on executives' outside board service and its contribution to their home firm: embeddedness and agency views (Ruigrok et al. 2006; Shropshire 2010; Geletkanycz and Boyd 2011). The embeddedness view argues that a corporate leader is influenced by relations to other leaders and by the structure of the network of relations such as board interlocks, and that such relations provide an important source of information and communication. Under this view, outside directorships are considered beneficial to the home firms because they afford access to important policies and practices of other firms, which in turn helps the executives to manage their home firms successfully. For instance, executives sitting on outside boards can learn about different management styles or strategies used in other firms (Booth and Deli 1996; Beckman and Haunschild 2002). Also, they can learn alternative approaches and strategies without incurring the costs of experimentation to their home firms (Burt 1987). Sitting on other boards also enables executives to establish a network with other directors (Fahlenbrach et al. 2010). Bacon and Brown (1975) summarize the potential benefits of executives' outside directorships as follows: (a) Benchmarking of others, (b) exposure to innovation, (c) obtaining information, (d) exposure to alternative management systems, and (e) receiving counsel.

Alternatively, the agency view suggests that, although executives enjoy financial benefits and other perquisites from outside directorships, little utility is accrued to their home firms (Davis 1991; Berger et al. 1997). Rather, it argues that multiple directorships are an indicator of personal

executives' motives for hiring connected auditors.

prestige and power. Consistent with this perspective, prior literature shows that top executives who hold outside directorships tend to be more powerful in board decisions and thus in a better position to entrench themselves and to behave opportunistically. For instance, executives receive numerous rewards from outside directorships, including board pay and pension (Yermack 2004), as well as elevated prestige and standing in social circles (Useem 1984). This elevated professional standing enables the executives to demand higher pay at home firms (Zajac and Westphal 1996) and to exercise greater intra-organizational power (Frankelstein 1992), which increases the possibility of managerial entrenchment. Consistent with this possibility, studies find that top executives' outside board ties are associated with a lower sensitivity of CEO turnover to firm performance (Balsmeier et al. 2011), value-destroying mergers (El-Khatib et al. 2015), and adoptions of golden parachutes (Wade et al. 1990) and poison pills (Davis 1991), all of which protect managers' interests at the expense of shareholders. Together, these studies suggest that outside directorship not only distracts executives from their internal duties but also advances the executives' personal interests at the expense of those of the home firm and its shareholders.

2.3. Hypotheses development

When the CEO/CFO of a home firm serves on the AC of another firm (*connected firm*), the executive has opportunities to build network ties to the connected firm's auditor (*connected auditor*) and to assess the auditor's audit quality because the AC members frequently interact with the auditor to discuss important accounting and auditing issues. Auditors also liaise with BOD members to discuss critical issues such as financial distress, restructuring, and internal controls (Cohen et al. 2007), and interact through their common acquaintances with AC members (Cai and Sevilir 2012; Chiu et al. 2013). Thus, executives with such a network have opportunities to learn about the connected firm's auditor, audit practice, and audit quality.

According to the embeddedness view, the CEO/CFO's board networks could enable the home firm to make a more informed auditor selection decision because the CEO/CFO with such an interlocking relationship has good knowledge about the connected auditor through observations and interactions, thereby reducing the uncertainty of a new auditor. Moreover, given the pre-existing knowledge and working experience, the CEO/CFO will be able to communicate more effectively and establish a better working relationship with the connected auditor, which has been argued as one of the most important factors in determining the choice of auditor (Beattie and Fearnley 1995; Eichenseher and Shields 1983).¹¹ If this is the case, the home firm may prefer to hire the connected auditor instead of other auditors.

Under the agency view, the CEO/CFO may use the connection to appoint a cozy auditor who can provide more lenient audit judgments. By hiring the connected auditor, the CEO/CFO could exercise greater bargaining power over the auditor because the CEO/CFO can exert influence on auditor hiring, retention, firing, and compensation decisions in both home and connected firms. In particular, prior studies suggest that CEOs of other firms maintain elevated status among independent directors and thus have greater clout than other directors in making board- or committee-level decisions (Fich 2005; Erkens and Bonner 2013). The elevated status of CEO/CFOs empowers them to exercise more influence over the AC's perception of the auditor, even though each has just one vote on the board or AC at the connected firm. Thus, the CEO/CFOs may prefer to choose connected auditors to the extent that they expect to exert influence over the

¹¹ In addition, McCracken et al. (2008) show that, when audit firms assign their audit partners, they consider client CFOs' preferences for certain partners, suggesting that the relationship between client CFO and audit partner is important for auditing.

connected auditor when resolving important issues in auditor-client contracting and audit adjustments for their home firms.

Although those incentives exist, SOX mandated that ACs be directly responsible for appointment and oversight of auditors. If SOX is effective in removing CEO/CFO influence over auditor selection, no relationship between CEO/CFO-auditor interlocks and auditor selection will be observed, especially when the CEO/CFO's preference for the connected auditor is attributable to the agency view. In contrast, if the AC members of the home firm largely support hiring auditors preferred by the CEO/CFO, the interlocks may affect the selection of the connected auditor. Prior research finds evidence consistent with this view. For instance, Gendron and Bedard (2006) suggest that AC members normally do not resist when management does not want to renew the incumbent auditor. Other studies also report managers influencing auditor selection and retention decisions after SOX (Cohen et al. 2010a; Fiolleau et al. 2013; Dhaliwal et al. 2015). Beck and Mauldin (2014) also find that, even after SOX, CFOs significantly influence audit fee decisions. These results raise doubt about the effectiveness of SOX with respect to controlling management influence over audit-related matters. Therefore, we predict that CEO/CFO-auditor interlocks increase the likelihood that the home firm hires a connected auditor. We posit the following hypothesis in an alternative form:

H1: *A home firm is more likely to appoint a connected auditor when the firm switches its auditor.*

When the home firm switches to a connected auditor, it is unclear how the CEO/CFO-auditor interlocking relation affects subsequent audit quality. The embeddedness theory suggests that the relation could have a positive impact on audit quality because of effective communication and information transfers between auditor and client. Prior research also suggests that network ties

among economic agents improve information transfer and reduce costs of gathering information (Cai and Sevilir 2012; Engelberg et al. 2012). As such, the connected auditor has better access to information about managers and their reporting incentives, which in turn helps the auditor to identify audit risk and resolve potential problems in a timely manner. Moreover, the connected auditor will be able to better understand the clients' business model and future plans, details of transactions and accounts, and the internal control system. This will allow the auditor to plan and organize the audit process in more effective ways, thereby improving audit quality.

Alternatively, the CEO/CFO-auditor networks may pose a threat to auditor independence under the agency view. As discussed earlier, hiring a connected auditor may provide the CEO/CFO with greater bargaining power over the auditor because the officer can affect audit engagements for both home and connected firms. DeAngelo (1981) shows that auditors have incentives to retain economically important clients. In our setting, auditors may perceive the interlocked CEO/CFOs as more powerful and economically important due to their ability to exert influence over auditor retention and audit fee decisions in both home and connected firms. In fact, existing literature shows the evidence of client bargaining power influencing auditor behavior. For example, auditors are less likely to issue a going concern opinion and are more likely to waive proposed audit adjustments for larger clients (McKeown et al. 1991; Nelson et al. 2002). These studies suggest that the connected auditor can be more susceptible to the CEO/CFO's pressure to obtain preferred audit outcomes, thereby inducing lower audit quality.¹²

¹² It is possible that the connected auditor is unwilling to compromise independence, despite the CEO/CFO's bargaining power, given that SOX implemented numerous steps to improve audit quality and auditor independence. Moreover, the newly created PCAOB increased both oversight and penalties for audit-related deficiencies. Under this possibility, the CEO/CFO's great bargaining power may not result in lowered audit quality.

Moreover, the network ties between the CEO/CFO and auditor could create homophily (i.e., mutual affinity) and favoritism bias (i.e., tendency to interpret connected others' intentions and actions favorably) (Tajifel and Turner 1986; McPherson et al. 2001; Guan et al. 2016). The homophily theory argues that frequent interactions between people tend to develop ties and create mutual caring and trust (Silver 1990; Pelled et al. 1999; McPherson et al. 2001). In the context of audit, the connections with the CEO/CFO may induce the auditor to overestimate the trustworthiness of the CEO/CFO and to be less skeptical about management representation (Nelson 2009). The lowered professional skepticism may result in a less objective audit risk assessment and insufficient substantive tests, adversely affecting audit quality. This view is consistent with prior evidence that audit firm alumni affiliation negatively affects audit quality (Menon and Williams 2004; Lennox 2005).

Taken together, the appointment of a connected auditor can either improve or impair the subsequent audit quality for the home firm. Therefore, we develop the following two competing hypotheses:

H2a: *Hiring a connected auditor improves subsequent audit quality.*

H2b: *Hiring a connected auditor impairs subsequent audit quality.*

3. Sample selection and research design

3.1. Measuring CEO/CFO-auditor interlocks

To measure CEO/CFO-auditor interlocks, we first identify CEO/CFOs and their outside directorships using the *BoardEx* database.¹³ To comprehensively identify CEO/CFO outside

¹³ From the *BoardEx* database, CEOs are identified based on the following titles: CEO, acting CEO, interim CEO, co-CEO, group CEO, chief executive (officer), group chief executive (officer), company leader, and group leader. Similarly, CFOs are identified based on the following titles: CFO, acting CFO, co-CFO, interim CFO, group CFO, CFO (part-time), chief financial/finance (officer), and principal financial/finance (officer).

directorships and to focus on the current post-SOX regime, we limit our sample period to 2003–2012.¹⁴ We then collect each firm’s auditor identity from *Audit Analytics*. When a CEO/CFO serves as an outside director of another firm hiring a certain auditor, the CEO/CFO is considered to have network ties to the auditor. If a CEO/CFO serves on the boards of multiple firms that hire different auditors, the CEO/CFO is treated as having network ties to each of those auditors.¹⁵

3.2. Sample selection

The sample selection procedure for auditor choice analysis is outlined in Table 1. Starting from an intersection of *Compustat* and *Audit Analytics* from 2003 through 2012, our initial sample consists of 1,157 firm-year observations that switched to Big 4 auditors. We limit the sample to firms switching to Big 4 auditors to make our sample firms more homogenous. Furthermore, since very few observations are tied to non-Big 4 auditors, it would be difficult to implement our auditor choice analysis for non-Big 4 auditors. We then eliminate 163 observations with missing SIC codes from *Compustat* and 189 observations in financial services industries (SIC codes 6000–6999). We also drop 166 observations that are not covered by *BoardEx*. Finally, we remove 42 observations due to a missing value on any of the control variables for auditor selection analysis. Accordingly, we are left with 597 observations switching to Big 4 auditors.

[Insert Table 1 here]

¹⁴ *BoardEx* provides biographical information about senior managers and board members. The database started to collect the information in 2003, backfilling data to 2000. In 2005, *BoardEx* carried out a major extension of its coverage, backfilling data to 2003, which substantially increased the coverage. Our exploration of the database reveals that the number of U.S. firms covered by *BoardEx* increased from 2,028 in 2002 to 4,154 in 2003. Its coverage gradually increases in subsequent years, providing data for more than 5,000 firms annually for recent years. Despite the extended coverage, we might fail to identify some CEO/CFOs’ external directorships because *BoardEx* does not cover all public firms in the U.S. However, this failure is likely to bias against our findings.

¹⁵ Among 597 auditor switching firms in the final sample, we find that the CEO/CFOs of 412 firms do not serve as outsider directors of any firms covered by *BoardEx*. The CEO/CFOs of 130 firms serve as outside directors of only one firm in the *BoardEx* universe. The CEO/CFOs of 41 (10, 2, 2) firms have two (three, four, five) external directorships, so that some of them have connections to more than one audit firm.

To test the impact of hiring connected auditors on subsequent audit quality, we implement a difference-in-differences research design. In detail, we compare the change in audit quality from the pre- to post-auditor-switch periods for firms switching from a non-connected auditor to a connected one (i.e., treatment firms), to the change for other firms switching from a non-connected auditor to another non-connected one (i.e., control firms). We employ three proxies for audit quality: restatements, meeting or beating earnings benchmarks (analysts' consensus forecasts and zero earnings), and absolute discretionary accruals. For each treatment and control firm, we retain two-year observations immediately before and after auditor change, respectively. To test with balanced panel data, if any of the required variables during the four consecutive years for a firm are missing, all observations of the firm are dropped.¹⁶ After applying these criteria, our sample for audit quality analysis consists of 1,352, 472, 1,352, and 1,044 firm-year observations from 338, 118, 338, and 261 unique firm-year observations for the tests with restatements, meeting/beating analysts' consensus forecasts, zero earnings, and absolute discretionary accruals, respectively.

3.3. Research design

3.3.1. Auditor selection model

To investigate whether auditor switching firms are more likely to appoint a connected auditor among the Big 4, we estimate the following logistic model for each of Big 4 auditors, adapted from Dhaliwal et al. (2015) and Lennox and Park (2007):¹⁷

$$\begin{aligned}
 XX = & \alpha_0 + \alpha_1 \text{Conn}XX + \alpha_2 \text{FBig4} + \alpha_3 \text{Match}XX + \alpha_4 \text{Spec}XX + \alpha_5 \text{Alumni}XX + \alpha_6 \text{ACsize} \\
 & + \alpha_7 \text{ACexpertise} + \varepsilon
 \end{aligned}
 \tag{1}$$

¹⁶ Our results are qualitatively similar when we use unbalanced panel data without this restriction.

¹⁷ We omit firm and year subscripts for conciseness in all models.

where the dependent variable XX is an indicator variable equal to one if the incoming auditor is XX , and zero otherwise, where XX is PwC, EY, Deloitte, or KPMG. For example, PwC is equal to one if the firm appoints PwC as its new auditor and zero if the firm appoints one of the other three auditors. Our variable of interest, $ConnXX$, is an indicator variable equal to one if the CEO/CFO of the firm serves as an independent director of another firm who hires the auditor XX , and zero otherwise.¹⁸ Our H1 predicts $\alpha_1 > 0$.

Following prior research, we control for several factors that may influence firms' auditor selection. $FBig4$ is an indicator variable equal to one if the predecessor auditor was a Big 4 auditor, and zero otherwise. $MatchXX$ is an indicator variable equal to one if the firm is better matched with XX than with any of the other Big 4 auditors, and zero otherwise, which is estimated based on Lennox and Park (2007)'s clientele match model. $SpecXX$ is an indicator variable equal to one if the auditor XX has the largest market share of audit fees in the industry-year cohort to which the given client belongs, and zero otherwise. $AlumniXX$ is an indicator variable equal to one if the CEO, CFO, or Chief Accounting Officer (CAO) formerly worked for the auditor XX , and zero otherwise. $ACsize$ is the number of directors on the audit committee. Finally, $ACexpertise$ is an indicator variable equal to one if audit committee includes at least one accounting expert, and zero otherwise.

3.3.2. Audit quality models

Following a comprehensive review of DeFond and Zhang (2014), we use three commonly used proxies for audit quality: restatements, meeting/beating earnings benchmarks, and

¹⁸ Note that firms currently hiring XX (e.g., PwC) are not able to switch to XX (e.g., PwC). Thus, we estimate Eq. (1) after dropping firms whose predecessor auditor corresponds to XX . For example, to test whether firms with CEO/CFO-PwC ties are more likely to appoint PwC, we estimate the model with 461 auditor-switching firms after removing 136 firms whose incumbent auditor was PwC ($597 - 136 = 461$).

discretionary accruals. These proxies capture complementary dimensions of audit quality, such as both egregious audit failures and mild “within GAAP” earnings management, and both discrete and continuous measures.¹⁹ We obtain inferences from these multiple proxies because each measure has both weaknesses and strengths (DeFond and Zhang 2014).

DeFond and Subramanyam (1998) find that auditors’ preference for conservative accounting is systematically associated with discretionary accruals in pre- and post-auditor-switch periods. Shu (2000) also argues that auditor changes are associated with increased auditor litigation risk and client financial distress, which could bias our audit quality tests if we perform tests only with the sample of firms that switch to connected auditors. To mitigate these concerns, we employ a difference-in-differences research design using firms switching from non-connected auditors to connected ones as treatment firms, and firms switching from non-connected auditors to non-connected ones as control firms.²⁰ Since the changes in audit quality for control firms are used to capture common auditor change effects, the difference in the changes between treatment and control firms is regarded as the incremental effect of hiring connected auditors over the common effects.

Our first proxy for audit quality is the likelihood of restating financial statements. Restatements are direct and egregious measures of audit quality because they indicate that the previously reported financial statements were unreliable and that auditors failed to correct the

¹⁹ Another popular measure of audit quality is the auditor’s propensity to issue going-concern opinions. We are unable to employ this measure because all firms switching to a connected auditor in our sample receive a clean audit opinion for both pre- and post-auditor-switch periods.

²⁰ Among 597 auditor switching firms, 73 (486) firms switched from a non-connected auditor to a connected (non-connected) auditor, forming our treatment (control) group. These sample sizes are greater than those of Dhaliwal et al. (2015), who find that, among 420 post-SOX Big 4 appointments, 52 (368) firms switched to an affiliated (non-affiliated) auditor. Note that we exclude 33 (5) firms that switched from a connected auditor to a non-connected (another connected) auditor from our audit quality test samples to obtain clean treatment and control firms. Since the number of these firms is too small, we could not implement meaningful tests for the changes in audit quality.

misstatements. Thus, if hiring connected auditors leads to lower (higher) audit quality, firms appointing such auditors are more (less) likely to misstate financial statements and thus issue restatements in a subsequent period. To test this prediction, we estimate the following logistic model adapted from Francis et al. (2013):

$$\begin{aligned}
 \text{Restatement (or DecRestatement)} = & \beta_0 + \beta_1 \text{Post} + \beta_2 \text{Treat} + \beta_3 \text{Post} * \text{Treat} \\
 & + \beta_4 \text{LogTA} + \beta_5 \text{ROA} + \beta_6 \text{Market-to-Book} + \beta_7 \text{Leverage} + \beta_8 \text{Issue} \\
 & + \beta_9 \text{NonAuditFeeRatio} + \beta_{10} \text{MSALeader} + \beta_{11} \text{NationalLeader} + \beta_{12} \text{Cimportance} \\
 & + \beta_{13} \text{Big4} + \beta_{14} \text{AlumniAud} + \beta_{15} \text{CEOisChair} + \beta_{16} \text{BDindep} \\
 & + \beta_{17} \text{ACsize} + \beta_{18} \text{ACexpertise} + \text{Industry dummies} + \text{Year dummies} + \varepsilon
 \end{aligned} \tag{2}$$

where *Restatement (DecRestatement)* is an indicator variable that equals one if the firm-year financial statements are misstated and thus subsequently restated (the earnings for the firm-year are overstated and thus subsequently restated downward), and zero otherwise.²¹ *Treat* is an indicator variable equal to one if the firm switches to a connected auditor, and zero otherwise. Firms switching from a non-connected auditor to a connected auditor comprise treatment firms (*Treat* = 1), while firms switching from a non-connected auditor to another non-connected auditor are control firms (*Treat* = 0). *Post* is an indicator variable equal to one for the periods subsequent to auditor switch, and zero otherwise.²² Thus, *Post * Treat* captures the incremental change in the likelihood of restatements for the treatment firms, relative to the control firms.²³ Following prior

²¹ We separately test with *DecRestatement* because auditors tend to be more concerned about their clients' income-increasing misstatements which are more likely intentional and egregious (Kim et al. 2003). When *DecRestatement* is used as the dependent variable, we exclude income-increasing restatements from the sample.

²² Since our auditor switches occur in 2003–2012, the *Post* variable captures years up to 2013. However, the misstatements in the subsequent two years (e.g., 2012 and 2013) may have not been fully detected because the detection normally takes a few years. To alleviate this concern, we replicate the analysis after limiting the sample to auditor switches in 2003-2010. The results, unreported, are qualitatively similar.

²³ Ai and Norton (2003) show that, in a logit model with interaction terms, the effect of the interaction term on expected probability can be different in sign from the coefficient loading on the interaction term. However, Puhani (2012) shows that, when the interaction term is simply the product of a treatment group dummy variable (e.g., *Treat*) and a treatment period dummy variable (e.g., *Post*), the sign of the treatment effect is equal to the sign of the coefficient of the interaction term. Based on insights derived from this study, we believe that it is appropriate to infer the sign of the treatment effect based on the sign of the *Post * Treat* coefficient, as we have done.

research (e.g. Cohen et al. 2014), we control for client- and auditor-specific characteristics that may affect audit quality. Definitions for these control variables are presented in the Appendix. In addition, we include industry dummies to control for time-invariant industry-fixed effects and year dummies to control for possible changes in audit quality over time, respectively.²⁴

Our second proxy measures the auditor's ability to limit earnings management to meet or beat two earnings benchmarks: analysts' consensus forecasts and zero earnings. If connected auditors are more (less) likely to detect and constrain earnings management aimed at avoiding negative earnings surprises or losses, the clients of these auditors are less (more) likely to meet or beat these two benchmarks. To test this prediction, we estimate the following model adapted from Dhaliwal et al. (2015) and Reichelt and Wang (2010):

$$\begin{aligned}
 \textit{MeetConsensus (or MeetZero)} = & \theta_0 + \theta_1 \textit{Post} + \theta_2 \textit{Treat} + \theta_3 \textit{Post} * \textit{Treat} \\
 & + \theta_4 \textit{LogTA} + \theta_5 \textit{ROA} + \theta_6 \textit{Market-to-Book} + \theta_7 \textit{Leverage} + \theta_8 \textit{Issue} \\
 & + \theta_9 \textit{NonAuditFeeRatio} + \theta_{10} \textit{MSALeader} + \theta_{11} \textit{NationalLeader} + \theta_{12} \textit{Cimportance} \\
 & + \theta_{13} \textit{Big4} + \theta_{14} \textit{AlumniAud} + \theta_{15} \textit{CEOisChair} + \theta_{16} \textit{BDindep} \\
 & + \theta_{17} \textit{ACsize} + \theta_{18} \textit{ACexpertise} + \textit{Industry dummies} + \textit{Year dummies} + \varepsilon
 \end{aligned} \tag{3}$$

where *MeetConsensus* is an indicator variable equal to one if earnings meet or beat the latest analysts' consensus earnings forecasts by three cents per share or less, and zero otherwise. *MeetZero* is an indicator variable equal to one if the firm reports a small profit that is less than three percent of the average total assets, and zero otherwise.²⁵ Similar to the previous model, *Post* * *Treat* captures the incremental change in the likelihood that the treatment firms meet or beat the earnings benchmarks, relative to that of the control firms. Following previous studies (e.g. Reichelt

²⁴ In all models for audit quality tests, continuous variables are winsorized at 1 percent and 99 percent, and the *p*-values are calculated with client firm-clustered standard errors.

²⁵ Our untabulated analyses show that the results are qualitatively similar when *MeetConsensus* is defined as one if earnings meet or beat the latest analysts' consensus earnings forecasts by *one* cent per share or less and zero otherwise, and *MeetZero* as one if the firm reports a small profit that is less than *one* percent of the average total assets and zero otherwise, although the mean values of *MeetConsensus* and *MeetZero* are much smaller (0.097 and 0.048).

and Wang 2010), we add several control variables, defined in the Appendix.

Our third proxy is absolute discretionary accruals. Since Keung and Shih (2014) suggest that performance-matching procedures in Kothari et al. (2005) may introduce noise into measurement of discretionary accruals, we use both performance-matched discretionary accruals and unmatched ones estimated from the Jones model. If CEO/CFO-auditor interlocks lead to higher (lower) audit quality, we expect firms switching to connected auditors to report smaller (greater) absolute discretionary accruals. We test this prediction by estimating the following model adapted from Reichelt and Wang (2010):

$$\begin{aligned}
|PMJDA| \text{ (or } |JDA|) = & \gamma_0 + \gamma_1 Post + \gamma_2 Treat + \gamma_3 Post * Treat \\
& + \gamma_4 LogTA + \gamma_5 ROA + \gamma_6 Market\text{-to-Book} + \gamma_7 Leverage + \gamma_8 Issue \\
& + \gamma_9 AltmanZ + \gamma_{10} StdCFO + \gamma_{11} LitIndustry + \gamma_{12} FirmAge + \\
& + \gamma_{13} NonAuditFeeRatio + \gamma_{14} MSALeader + \gamma_{15} NationalLeader + \gamma_{16} Cimportance \\
& + \gamma_{17} Big4 + \gamma_{18} AlumniAud + \gamma_{19} CEOisChair + \gamma_{20} BDindep \\
& + \gamma_{21} ACsize + \gamma_{22} ACexpertise + Industry\ dummies + Year\ dummies + \varepsilon
\end{aligned} \tag{4}$$

where $|PMJDA|$ is absolute value of performance-matched discretionary accruals (Kothari et al. 2005) and $|JDA|$ is absolute discretionary accruals estimated from the Jones model (Jones 1991). $Post * Treat$ captures the incremental change in the absolute discretionary accruals of firms switching to connected auditors, compared with those switching to non-connected auditors. As in prior studies (e.g., Reichelt and Wang 2010), we include several control variables, defined in the Appendix.

4. Empirical results

4.1. Auditor selection analysis

Table 2, Panel A provides the transition matrix of Big 4 appointments for our sample firms. Among 597 sample firms that change auditors, 136 clients of PwC switch to other Big 4 auditors.

Likewise, 121, 112, and 98 clients switch from EY, Deloitte, or KPMG, respectively. Also, 130 clients of non-Big 4 firms upgrade their auditors to Big 4 auditors. Among these sample firms, 113 clients switch to PwC as their incoming external auditor, while 193, 129, and 162 firms appoint EY, Deloitte, or KPMG, respectively. This distribution is similar to that reported by Dhaliwal et al. (2015).

Table 2, Panel B provides univariate test results of whether clients tend to hire connected auditors. Among 597 auditor change firms, the CEO/CFOs of 56 firms are connected to PwC through their outside directorships, while the CEO/CFOs of the other 541 firms do not have such a connection with PwC. More importantly, 17 of 56 firms with CEO/CFO-PwC ties (30.4 percent) appoint PwC as their new auditor, while only 96 of 541 firms without such ties (17.7 percent) appoint PwC. This difference is statistically significant (p -value = 0.022), indicating that clients with CEO/CFO-PwC ties are more likely to switch to PwC than clients without such ties. The results are similar for EY (51.5 percent vs. 29.9 percent with p -value < 0.001) and Deloitte (32.4 percent vs. 20.9 percent with p -value = 0.099). The relationship is weaker for KPMG, but the difference is in the same direction (31.9 percent vs. 26.7 percent with p -value = 0.444). The last row of Panel B shows that the total number of observations whose CEO/CFOs have connections with any Big 4 auditors is 206 (56 + 66 + 37 + 47), while the number of observations without such a connection is 2,182 (541 + 531 + 560 + 550). We find that 37.9 percent of the former firms appoint connected auditors, while just 23.8 percent of the latter firms appoint the respective auditors. The difference is statistically significant at $p < 0.001$.²⁶ Overall, our univariate analysis in Table 2 provides preliminary support for H1.

²⁶ Following Dhaliwal et al. (2015), when we employ 25 percent, which is a probability that one of Big 4 auditors is randomly selected, as an alternative benchmark, the difference is still significant at $p < 0.001$.

[Insert Table 2 here]

Table 3, Panel A reports descriptive statistics for the variables used in the auditor selection model for each Big 4 auditor. Firms currently hiring *XX* auditor are excluded in *XX* selection analysis because they cannot switch to the same *XX* auditor. This exclusion leaves 461, 476, 485, and 499 firms for the model with PwC, EY, Deloitte, or KPMG, respectively. The panel shows that about 9.3 percent of the PwC sample have CEO/CFO-PwC ties. Likewise, about 10.9, 5.7, and 7.8 percent of the sample for EY, Deloitte, or KPMG are connected to EY, Deloitte, or KPMG, respectively.

Table 3, Panel B presents the logistic regression results of auditor selection decisions for each Big 4 auditor. We find positive and significant coefficients on *ConnXX* for all Big 4 auditors but KPMG. These results suggest that our sample firms tend to hire auditors connected to their CEO/CFOs, in line with our univariate test results. Control variables are generally consistent with previous research (Lennox and Park 2007; Dhaliwal et al. 2015). For example, firms that hired Big 4 auditors previously (*FBig4*) are more likely to appoint another Big 4 auditor. Consistent with Lennox and Park (2007) and Shu (2000), firms tend to hire well-matched auditors (*MatchXX*). Finally, firms with officers who formerly worked for audit firms are more likely to hire their alumni (*AlumniXX*).²⁷ For robustness, we perform auditor selection analysis with a multinomial logit model instead of a set of binary ones because a client may consider all Big 4 auditors at the same time. Utilizing firms appointing KPMG as a reference group, we find that firms connected to PwC (Deloitte, EY) are more likely to appoint PwC (Deloitte, EY) over KPMG, giving credence to our previous results.

²⁷ Our results are robust when we add a bankruptcy score, leverage, an indicator for the issuance of debt and equity, board independence, and an indicator for CEO-chairperson duality, following Lennox and Park (2007).

Since both the embeddedness and agency views predict the same positive relationship between CEO/CFO-auditor ties and the appointment of connected auditors, it is difficult to infer which view drives the reported results. However, it seems reasonable to predict that, under the embeddedness view, the likelihood of hiring a connected auditor is higher when the connected auditor exhibits superior audit quality at the connected firms. To further provide insights, we examine whether hiring a connected auditor is associated with observed audit quality at connected firms. We restrict the sample to home firms with at least one connected firm. Note that when a home firm is connected to more than a connected firm, we include the respective pairs in the sample. We estimate the following model adapted from Lennox and Park (2007):

$$\begin{aligned}
HiringConn = & \pi_0 + \pi_1 ConnAQ + \pi_2 ConnAbFees + \pi_3 LogTA + \pi_4 BankruptcyScore \\
& + \pi_5 FBig4 + \pi_6 LitIndustry + \pi_7 ACsize + \pi_8 ACexpertise + \pi_9 SpecConn \\
& + \pi_{10} MatchConn + \pi_{11} AlumniConn + \pi_{12} Dismissal + \varepsilon
\end{aligned} \tag{5}$$

where *HiringConn* is an indicator variable equal to one if the home firm hires its connected auditor, and zero otherwise. *ConnAQ* is either *ConnAQ1*, *ConnAQ2*, or *ConnAQ3*; *ConnAQ1* is an indicator variable equal to one if the connected firm does not misstate its financial statements in the past two years, and zero otherwise; *ConnAQ2* is an indicator variable equal to one if the connected firm does not meet or just beat zero earnings benchmarks in the past two years, and zero otherwise; *ConnAQ3* is an indicator variable equal to one if the connected firm's absolute performance-matched discretionary accruals belong to the lowest quartile, and zero otherwise. *ConnAbFees* is a quartile variable that is transformed from abnormal fee of the connected firm. *ConnAbFees* takes 0 (lowest quartile), 1, 2, and 3 (highest quartile). Definitions for the control variables are presented in the Appendix. The results are provided in Table 3, Panel C. All three columns show that the likelihood of hiring a connected auditor is not significantly associated with higher audit quality of connected auditors, which is inconsistent with our prediction under the embeddedness view. In

addition, we find a negative and marginally significant coefficient on *ConnAbFees* in two columns, which implies that the likelihood of hiring connected auditors is lower when the auditors receive abnormally high audit fees from connected firms.

[Insert Table 3 here]

4.2. Audit quality analysis

4.2.1. Descriptive statistics

Table 4, Panel A provides summary statistics for the dependent variables used for our audit quality analyses. Among 1,352 (1,308) firm-year observations used for the restatement (income-decreasing restatement) analysis, about 13.2 (12.1) percent misstate their financial statements and subsequently restate them (restate their reported earnings downward). Regarding the sample for meeting/beating analysis, 22.2 percent of the sample report earnings that meet or beat analysts' consensus forecasts, while 15.6 percent report small profits. The mean values of */PMJDA/* and */JDA/* are both 0.064, which are comparable to prior studies.

Table 4, Panel B presents descriptive statistics for control variables. The key statistics for control variables appear similar to those in prior research (e.g., Cohen et al. 2014; Reichelt and Wang 2010). The mean value of firm size (*LogTA*) and return on assets (*ROA*) are 20.261 and -0.018, respectively. The mean value of non-audit fees paid to external auditors are 16.8 percent of total fees (*NonAuditFeeRatio*). The average audit committee size (*ACsize*) is 3.525.

[Insert Table 4 here]

4.2.2. Restatement analysis

Table 5 reports the results of the logistic regression of restatements. In column (1), we estimate the effect of hiring connected auditors on the likelihood of misstatements. The coefficient on *Post * Treat* is positive and significant at $p < 0.01$, suggesting that the increase in the likelihood

of misstatements subsequent to auditor switch is greater for firms switching to connected auditors than for firms switching to non-connected auditors.²⁸ A negative coefficient on *Post* is consistent with the declining trend of restatements over time (Scholz 2014). A negative coefficient on *Treat* implies that, in the pre-auditor switch period, treatment firms are less likely to restate their financial statements, relative to control firms, which could be derived from differences in firm characteristics between two groups (e.g., firm size). To mitigate this concern, we replicate our analysis using the propensity score matched sample in a later section and find that our results are qualitatively unchanged.

Since income-decreasing restatements could better capture managers' opportunistic reporting behavior (Kedia and Rajgopal 2011; Hennes et al. 2014),²⁹ we use income-decreasing restatements as an alternative measure for audit quality in column (2). We find that the coefficient on *Post * Treat* is also positive and significant at $p < 0.01$ in this column, corroborating our finding in column (1). Overall, the findings in Table 5 suggest that firms that switch to connected auditors are more likely to misstate their financial statements subsequent to auditor changes than those that switch to non-connected auditors, consistent with H2b that hiring a connected auditor impairs subsequent audit quality.

[Insert Table 5 here]

4.2.3. Analysis for meeting or beating earnings benchmarks

²⁸ To assess the economic significance of the results in Column (1), Table 5, we estimate how the likelihood of a misstatement for treatment and control firms changes from the pre- to post-auditor-change periods, holding other variables constant at their median values. The misstatement probabilities are found to be (a) 3.4% for treatment firms in the pre-period, (b) 11.8% for treatment firms in the post-period, (c) 7.6% for control firms in the pre-period, and (d) 4.0% for control firms in the post-period. Thus, the increase in the misstatement probabilities for treatment firms is substantially greater than that for control firms, suggesting that the results are economically significant, as well as statistically significant.

²⁹ Note that income-decreasing restatements occur after firms previously engage in aggressive, income-increasing earnings management.

Table 6 shows the logistic regression results of meeting or beating two earnings benchmarks. In column (1), we test whether firms appointing connected auditors are more likely to meet or beat analysts' consensus earnings forecasts. We find a positive and significant coefficient on *Post * Treat* at $p < 0.05$, indicating that the increase in the likelihood of meeting or beating the analysts' forecasts subsequent to auditor change is greater for firms hiring connected auditors than for firms hiring non-connected auditors. When we alternatively utilize meeting or beating zero earnings benchmarks in column (2), the results are qualitatively similar. These results imply that connected auditors allow managers greater accounting discretion to avoid negative earnings surprises or loss, supporting H2b. The signs of control variables are generally consistent with prior research.

[Insert Table 6 here]

4.2.4. Discretionary accruals analysis

Table 7 reports regression results for absolute discretionary accruals. In column (1), where we employ performance-matched discretionary accruals, we find that the coefficient on *Post * Treat* is significantly positive at $p < 0.10$, suggesting that firms switching to connected auditors exhibit a greater increase in absolute discretionary accruals from the pre- to the post-period than control firms. In column (2), where we alternatively use discretionary accruals estimated from the Jones model, we again find evidence that firms hiring connected auditors report greater absolute discretionary accruals, compared to firms switching to non-connected auditors. The signs of control variables are generally consistent with prior research. In sum, all regression results using three proxies for audit quality support H2b rather than H2a.

[Insert Table 7 here]

4.2.5. Tests with propensity score matched sample

Despite our research design of a difference-in-differences model, it is still possible that the difference in firm characteristics between treatment and control samples, rather than our variable of interest (hiring connected auditors), drives our results from audit quality analyses. In other words, if our control firms do not share similar firm characteristics with our treatment firms, this difference may introduce selection bias in evaluating the consequences of the treatment effect. To mitigate this concern, we perform a matched-sample analysis based on propensity score matching (PSM), following Lawrence et al. (2011).

We first calculate the likelihood that a firm switches to a connected auditor (i.e., a propensity score) by estimating a logistic regression model where the dependent variable equals one if the firm switches to a connected auditor and zero otherwise, and the independent variables are extracted from the respective audit quality models, Eq. (2) through (4), and measured in the year prior to auditor switch. We match a firm switching to a connected auditor (i.e., a treatment firm) with a firm switching to a non-connected auditor (i.e., a control firm) that has the closest propensity score, using a caliper distance of 0.03 without replacement, following Lawrence et al. (2011).^{30,31}

Table 8, Panel A shows the mean differences in independent variables between the treatment and control samples before and after PSM. Before the matching, treatment firms are larger (*LogTA*). They also have larger audit committee size (*ACsize*), lower non-audit service fee ratio (*NonAuditFeeRatio*), and lower financial distress (*AltmanZ*) than control firms. After PSM, we

³⁰ The only exception is meeting/beating analysts' consensus forecasts analysis where we do not use any caliper distance due to the small sample size. When we construct matching with the caliper distance of 0.03 for this analysis, only four treatment firms are matched with control firms, yielding 32 firm-year observations (8 firms * 4 years).

³¹ Our results are robust to using alternative caliper widths of 0.05, 0.1, 0.2, or 0.3. Also, the results are qualitatively similar when we replicate the analyses with replacement.

find that none of these firm characteristics is significantly different between two samples, indicating that our matching is conducted effectively.

Table 8, Panel B (Panel C and Panel D) presents the regression results of restatements (meet/beat earnings benchmarks and discretionary accruals) using PSM sample. The results are largely consistent with those reported earlier. For instance, the coefficient on *Post * Treat* is positive in all panels, five of which are statistically significant at least at $p < 0.10$.³² Thus, our PSM sample tests suggest that the observed decline in audit quality subsequent to switching to a connected auditor is unlikely to be attributable to the difference in firm characteristics.³³

[Insert Table 8 here]

4.2.6. *Ties through the same audit office or audit committee membership*

In this section we examine whether the negative relation between CEO/CFO-auditor interlocks and audit quality is more pronounced either (a) when the home and connected firms hire auditors from the same office of an audit firm or (b) when the CEO/CFO-auditor interlocks are via the CEO/CFO's AC membership in the connected firm. When home and connected firms appoint auditors from the same office of an audit firm, the CEO/CFOs are likely not only to have a greater bargaining power over the connected auditor but also to form a closer relationship with the auditor. At the same time, this situation will foster information transfers between the CEO/CFO and the auditor. Therefore, the effect of network ties between CEO/CFO and auditor on audit quality can

³² The only insignificant coefficient on *Post * Treat* is in the meet/beat analysts' consensus forecasts analysis, which may be attributable to the smaller sample size used in the analysis.

³³ One disadvantage of our PSM model is a small sample size relative to the number of predictors, which reduces statistical powers of our tests. To alleviate this concern, we alternatively estimate each model using bootstrap. For each analysis, we generate 100 datasets from the original sample. The number of observations in each of 100 samples is the same as the number for the original sample. Untabulated results reveal that the results are qualitatively similar.

be more pronounced when home and connected firms hire auditors from the same office, regardless of whether the implication is positive or negative.

Moreover, while we use the CEO/CFO's outside directorship as a primary measure in main analyses, the interaction with the auditor will be more active when the CEO/CFO serves on the AC of the connected firm, given that the AC oversees all audit-related matters. Thus, the CEO/CFOs are likely to build closer network ties to connected auditors and to have a greater bargaining power when they serve on the AC of connected firms. Accordingly, the effect of CEO/CFO-auditor interlocks on audit quality could be greater when the CEO/CFO serves on the AC of the connected firm.³⁴

Considering the two above situations, we split all CEO/CFO-auditor interlocks into the interlocks through the same office or AC membership, *Treat (Same Off or AC)*, and the interlocks through different audit offices of an audit firm and non-AC board membership, *Treat (Others)*. Thus, *Treat (Same Off or AC)* is an indicator variable equal to one if the firm switches to a connected auditor through either the same audit office or AC membership, and zero otherwise. *Treat (Others)* is an indicator variable equal to one if *Treat* is equal to one and *Treat (Same Off or AC)* is equal to zero, and zero otherwise.

Table 9, Panel A shows the results of logistic regression of restatements. We find a positive and significant coefficient on *Post * Treat (Same Off or AC)* at $p < 0.01$ whether *Restatement* or *DecRestatement* is used as the dependent variable. However, we find positive but insignificant

³⁴ Among 597 firms switching to Big 4 auditors in the sample, the number of firms with CEO/CFO-auditor ties via AC membership is 98, while that via board membership is 185. Moreover, the number of firms switching to connected auditors based on AC memberships is only 32, compared to 78 based on board membership. The number of firms switching to connected auditors via the same audit office is also small (37). To avoid problems resulting from small treatment sample, we combine these two types of connections into *Treat (Same off or AC)*. The number of firms with CEO/CFO-auditor ties through either the same office or AC membership is 57.

coefficients on *Post * Treat (Others)* in both models. Importantly, the results of Wald tests at the bottom of the panel show that the difference in the coefficients on *Post * Treat (Same Off or AC)* and *Post * Treat (Others)* is statistically significant in both models, indicating that firms switching to connected auditors through either the same office or AC membership are more likely to misstate their financial statements subsequent to auditor change, compared to firms switching to connected auditors through different audit offices of an audit firm and non-AC board membership.

When we use meeting or beating analysts' consensus forecasts as the dependent variable in the first column of Panel B, we find a positive and significant coefficient on *Post * Treat (Same Off or AC)*, which is statistically greater than that on *Post * Treat (Others)*. When zero earnings are used as the benchmark, both coefficients on *Post * Treat (Same Off or AC)* and *Post * Treat (Others)* are statistically significant, with an insignificant difference between the coefficients. Panel C reports the results of discretionary accruals analysis. In this panel, we find insignificant differences between the coefficients on *Post * Treat (Same Off or AC)* and *Post * Treat (Others)*.

Overall, half of our audit quality analyses provide evidence suggesting that the negative relationship between CEO/CFO-auditor interlocks and audit quality is more pronounced when the connections are through the same office or AC membership. In addition, when the interlocks are merely through different audit offices of an audit firm and non-AC board membership, the relation is significant only in one of the six regression analyses. These findings suggest that the adverse effect of hiring connected auditors on subsequent audit quality appears relatively stronger when the connection is via the same office or AC membership.

[Insert Table 9 here]

4.2.7. Audit fee analysis

Although it is not the focus of this paper, we examine how audit fees at home firms change surrounding auditor switches to connected auditors. On the one hand, it is possible that the CEO/CFO's greater bargaining power arising from hiring a connected auditor leads to audit fee reductions at home firms. Moreover, connected auditors may charge lower fees if better communication with the CEO/CFO facilitates efficient information exchanges, resulting in less audit effort. On the contrary, home firms might render a fee premium to their connected auditors in return for greater accounting discretion and/or heightened auditor litigation/reputation risk. Accordingly, it is *ex ante* unclear how audit fee pricing will change at home firms.

Another interesting issue is the change in audit fees at connected firms. The CEO/CFOs may attempt to influence their connected firms to pay higher audit fees to the connected auditors to reinforce their relationship. In this case, audit fees at connected firms may increase after home firms hire connected auditors. If the CEO/CFOs do not have such intentions or a significant influence over fee decisions at connected firms, hiring connected auditors at home firms may not induce substantial changes in audit fees at connected firms.

Table 10, Panel A presents univariate comparisons of changes in fee metrics at home firms between firms hiring a connected auditor and those hiring a non-connected auditor. For the analysis, we limit our sample to home firms with at least one connected firm and calculate audit fee changes (*Changes in log (audit fees)*) and abnormal audit fee changes (*Changes in abnormal audit fees*) from $t-1$ to t .³⁵ When those changes are compared between firms hiring a connected auditor and those hiring a non-connected auditor, we find that *Changes in abnormal audit fees* (*Changes in log (audit fees)*) is significantly (insignificantly) greater for the former. We find that the changes

³⁵ Abnormal fee is estimated based on the model by Choi et al. (2010). The definition of *ConnAbFees* in Appendix provides the details of the model.

in total fees and abnormal total fees are also significantly greater for the former. In addition, as reported in Panel B, the changes in the same fee metrics at connected firms are significantly greater after their respective home firms hire connected auditors than non-connected auditors.

Taken together, these findings suggest that, compared to non-connected auditors, connected auditors tend to receive higher fees from both home and connected firms after they are hired at home firms. This evidence is inconsistent with the CEO/CFO's bargaining power over fee pricing or better communication with auditors reducing fees. Rather, the results are more consistent with the CEO/CFO's willingness to pay higher fees to the connected auditors at both home and connected firms to compensate for greater accounting discretion for their home firms and/or resulting auditor litigation/reputation risk.

[Insert Table 10 here]

4.3. *Additional analyses*

We perform several additional analyses. First, one might argue that AC-auditor ties through outside directorship also affect auditor choice decisions and subsequent audit quality.³⁶ To examine whether the AC-auditor ties confound our findings, we repeat analyses after controlling for this relationship. We find that AC-auditor ties have no significant impact on auditor choice or audit quality. More importantly, our main findings remain qualitatively similar after the AC-auditor ties are controlled for in each model.

Second, we examine whether CEO-auditor and CFO-auditor ties have different implications for auditor selection decisions and subsequent audit quality. When we replicate four auditor choice regressions using CEO-auditor ties, untabulated results show all positive coefficients for *ConnXX*,

³⁶ Consistent with this argument, Chen et al. (2014) show that such interlocks are positively associated with ERCs.

two of which are statistically significant at $p < 0.05$. When we test with CFO-auditor ties, we find significantly positive coefficients on *ConnXX* for PwC and EY and insignificant coefficients for Deloitte and KPMG. Furthermore, when we repeat audit quality analyses, untabulated results indicate that our inferences remain largely similar when we examine CEO-auditor and CFO-auditor interlocks separately.

Third, when we exclude firms switching from non-Big 4 auditors from the sample, our results from auditor selection analyses remain similar. Regarding audit quality, we find qualitatively similar evidence from the analyses with restatements and meeting/beating earnings benchmarks. However, when we utilize absolute discretionary accruals as a proxy for audit quality, we lose statistical significance.

Fourth, while we focus on the effect of hiring interlocked auditors on the home firm's audit quality, it is possible that the connected firm's audit quality changes subsequent to the home firm's appointment of the connected auditor.³⁷ Our untabulated analyses find that the changes in audit quality for the connected firms of our treatment firms are statistically indifferent from those in connected firms of our control firms, suggesting that the adverse effect of CEO/CFO-auditor ties on audit quality exists only for the home firms.

5. Conclusion

This study investigates whether CEO/CFO-auditor interlocks through outside directorship affect auditor selection decisions and whether hiring connected auditors influences subsequent

³⁷ To examine this possibility, we adopt a difference-in-differences research design in which we compare the changes in audit quality from the pre- to post-auditor-switch periods for the connected firms of our treatment firms, with the changes in audit quality for other connected firms of our control firms, using our three proxies for audit quality.

audit quality. Our results show that home firms with such ties are more likely to hire connected auditors. We also find that switching to such connected auditors results in a lower audit quality, as evidenced by a greater likelihood of restatements, a higher propensity of meeting or beating earnings benchmarks, and greater absolute discretionary accruals. This evidence is more pronounced when the connection is via the same auditor office or AC membership. The results based on the PSM are consistent with prior findings.

This study provides useful policy implications. First, while SOX mandates that ACs be solely responsible for auditor selection, our evidence indicates that some managers continue to intrude on the decisions to appoint auditors from their networks. This suggests that the ACs of these firms fail to remove managers' influence over auditor appointment. Second, although SOX enforces various mechanisms to strengthen auditor independence and audit quality, our results show that external networks between managers and auditors can still undermine auditor independence and audit quality. Thus, this study calls for ensuring both AC effectiveness and auditor independence, especially in the presence of CEO/CFO-auditor interlocks.

Our study is subject to several caveats. First, we do not directly operationalize network ties of managers with audit engagement partners. Future research is warranted to examine the effect of the connections at the audit partner level when relevant data become available in the U.S. Second, our analyses are limited to the appointments of Big 4 auditors. Thus, our results may not be generalized to firms switching to non-Big 4 auditors. Third, the number of firms that switch to connected auditors in our sample is small, which might explain why some results of our audit quality tests are weak.

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Appendix: Variable Definitions

Variable:	Definition:
Variables Included in	Auditor Choice Analyses
<i>XX</i>	indicator variable equal to one if the incoming auditor is <i>XX</i> , and zero otherwise, where <i>XX</i> is either PwC (PricewaterhouseCoopers), EY (Ernst & Young), Deloitte, or KPMG.
<i>ConnXX</i>	indicator variable equal to one if CEO/CFOs serve as an independent director of another firm who hires the auditor <i>XX</i> , and zero otherwise.
<i>Fbig4</i>	indicator variable equal to one if the predecessor auditor was a Big 4 auditor, and zero otherwise.
<i>MatchXX</i>	indicator variable equal to one if the firm is better matched with <i>XX</i> than with any of the other Big 4 auditors, and zero otherwise. Following Lennox and Park (2007) and Dhaliwal et al. (2015), we begin with <i>COMPUSTAT</i> and <i>Audit Analytics</i> to identify Big 4 clients from 2003 to 2012 and estimate four logistic regression models where the dependent variable is each of Big 4 auditors and independent variables are firm size, financial health, and the client's industry identity (based on two-digit SIC codes). Using estimated coefficients from the four regressions, we measure the degree to which a given client is closely matched with each auditor's existing clients. For example, a client is better matched with PwC's clientele if the client's estimated probability of matching with PwC's clientele is the highest.
<i>SpecXX</i>	indicator variable equal to one if the auditor <i>XX</i> has the largest market share of audit fees in the industry-year cohort that the given client belongs to, and zero otherwise.
<i>AlumniXX</i>	indicator variable equal to one if the CEO, CFO, or Chief Accounting Officer (CAO) formerly worked for the auditor <i>XX</i> , and zero otherwise.
<i>ACsize</i>	the number of directors on the audit committee.
<i>ACexpertise</i>	indicator variable equal to one if audit committee includes at least one accounting expert, and zero otherwise. A director is defined as an accounting expert if he/she has work accounting experience as certified public accountants, CFO, controller, or vice president of finance, following Dhaliwal et al. (2015).
<i>HiringConn</i>	indicator variable equal to one if the home firm hires its connected auditor, and zero otherwise.
<i>ConnAQ1</i>	indicator variable equal to one if the connected firm does not misstate its financial statements in the past two years, and zero otherwise.
<i>ConnAQ2</i>	indicator variable equal to one if the connected firm does not meet or just beat zero earnings benchmarks in the past two years, and zero otherwise.
<i>ConnAQ3</i>	indicator variable equal to one if the connected firm's absolute value of performance-matched discretionary accruals (Kothari et al. 2005) belongs to the lowest quartile, and zero otherwise.
<i>ConnAbFees</i>	quartile variable which is transformed from abnormal fees of the connected firm. <i>ConnAbFees</i> takes 0 (lowest quartile), 1, 2, and 3 (highest quartile). Abnormal fee is calculated following Choi et al. (2010). Abnormal fee is the residual of audit fee regression where control variables are <i>LogTA</i> , <i>ROA</i> , <i>Loss</i> , <i>Leverage</i> , <i>Issue</i> , <i>LitIndustry</i> , sum of the inventory and account receivables, the square root of the number of employees, a foreign operation dummy, an extraordinary item dummy, and year and two-digit industry indicator variables.
<i>BankruptcyScore</i>	bankruptcy score, calculated by $-4.336 + (-4.512 * \text{return on assets}) + (5.679 * \text{debt/assets}) + (0.004 * \text{current ratio})$.

<i>SpecConn</i>	indicator variable equal to one if the connected auditor is MSA-level industry specialist auditor, and zero otherwise.
<i>MatchConn</i>	indicator variable equal to one if the connected auditor better matched with the home firm than with any of the other big 4 auditors, and zero otherwise.
<i>AlumniConn</i>	indicator variable equal to one if the home firm has an alumni affiliation with the connected auditor, and zero otherwise.
<i>Dismissal</i>	Indicator variable equal to one if the firm dismissed its predecessor auditor, and zero otherwise.
Variables Included in Audit Quality Analyses	
<i>Restatement</i>	indicator variable equal to one if the firm-year financial statements are misstated and subsequently restated, and zero otherwise.
<i>DecRestatement</i>	indicator variable equal to one if the earnings for the firm-year are overstated and subsequently restated downward, and zero otherwise.
<i>MeetConsensus</i>	indicator variable equal to one if earnings meet or beat the latest analysts' consensus earnings forecasts by three cents per share or less, and zero otherwise.
<i>MeetZero</i>	indicator variable equal to one if the firm reports a small profit (defined as a profit that is less than three percent of the average total assets), and zero otherwise.
<i> PMJDA </i>	absolute value of performance-matched discretionary accruals following Kothari et al. (2005).
<i> JDA </i>	absolute value of discretionary accruals estimated from the Jones model (Jones 1991).
<i>Post</i>	indicator variable equal to one for the periods subsequent to auditor switch, and zero otherwise.
<i>Treat</i>	indicator variable equal to one if the firm switches to a connected auditor, and zero otherwise.
<i>Treat (Same Off or AC)</i>	indicator variable equal to one if the firm switches to a connected auditor through <i>either</i> the same audit office <i>or</i> AC membership, and zero otherwise.
<i>Treat (Others)</i>	indicator variable equal to one if <i>Treat</i> is equal to one and <i>Treat (Same Off or AC)</i> is equal to zero, and zero otherwise.
<i>LogTA</i>	natural logarithm of total assets.
<i>ROA</i>	return on assets, defined as net income divided by total assets.
<i>Market-to-Book</i>	market value of equity divided by the book value of equity.
<i>Leverage</i>	sum of long term debt and debt in current liabilities divided by total assets.
<i>Issue</i>	indicator variable equal to one if sum of the equity and debt issued during the most recent three years is greater than five percent of total assets (AT) for year t, and zero otherwise.
<i>NonAuditFeeRatio</i>	non-audit service fees divided by total fees paid to the auditor.
<i>MSALeader</i>	indicator variable equal to one if the firm's auditor is office-level industry specialist auditor following Reichelt and Wang (2010), and zero otherwise.
<i>NationalLeader</i>	indicator variable equal to one if the firm's auditor is the national-level industry specialist auditor following Reichelt and Wang (2010), and zero otherwise.
<i>Cimportance</i>	ratio of the client's audit fees to the audit office's total revenues from audit services.
<i>Big4</i>	indicator variable equal to one if the firm's auditor is one of Big 4 audit firms, and zero otherwise.
<i>AlumniAud</i>	indicator variable equal to one if the firm's CEO, CFO, or Chief Accounting Officer (CAO) formerly worked for the auditor, and zero otherwise.
<i>CEOisChair</i>	indicator variable equal to one if the CEO is the chairperson of the board, and zero otherwise.

<i>BDindep</i>	the proportion of independent directors on the board.
<i>AltmanZ</i>	probability of bankruptcy based on the Altman's Z score (Altman 1983).
<i>StdCFO</i>	standard deviation of cash flows from operations scaled by lagged total assets from $t-2$ to t .
<i>LitIndustry</i>	indicator variable equal to one if the firm operates in a highly litigious industry defined as industries with SIC codes of 2833-2836, 3570-3577, 3600-3674, 5200-5961, 7370-7370, and zero otherwise.
<i>FirmAge</i>	the number of years the firm has Compustat data.

Table 1
Sample Selection

Firms switching auditors to a Big 4 audit firm over 2003-2012 from an intersection of Compustat and Audit Analytics	1,157
Less: Firms with missing SIC from Compustat	(163)
Less: Firms in financial services industries (SIC codes 6000-6999)	(189)
Less: Firms not covered by BoardEx	(166)
Less: Firms with a missing value on any of the control variables for auditor choice analyses	(42)
Number of firms used in auditor selection analyses	<hr/> 597

Table 2
Distribution of Auditor Changes

Panel A. Transition Matrix

		<i>Incoming auditor</i>				Total
		<i>PwC</i>	<i>EY</i>	<i>Deloitte</i>	<i>KPMG</i>	
<i>Predecessor auditor</i>	<i>PwC</i>		45	50	41	136
	<i>EY</i>	33		34	54	121
	<i>Deloitte</i>	32	49		31	112
	<i>KPMG</i>	22	49	27		98
	<i>Non-Big4</i>	26	50	18	36	130
Total		113	193	129	162	597

Panel B. Auditor Selection Depending on the Presence of CEO/CFO-auditor Interlocks

<i>Incoming Auditor</i>	<i>Connection</i>	<i> #(AudChg)</i>	<i> #(Hire)</i>	<i> % (Hire)</i>	<i> Difference</i>	<i> P-value</i>
<i>PwC</i>	No	541	96	17.7%	12.6%	0.022**
	Yes	56	17	30.4%		
<i>EY</i>	No	531	159	29.9%	21.6%	0.001***
	Yes	66	34	51.5%		
<i>Deloitte</i>	No	560	117	20.9%	11.5%	0.099*
	Yes	37	12	32.4%		
<i>KPMG</i>	No	550	147	26.7%	5.2%	0.444
	Yes	47	15	31.9%		
Total	No	2,182	519	23.8%	14.1%	0.001***
	Yes	206	78	37.9%		

Panel A describes a transition matrix of auditor changes in our sample. It includes the identities of predecessor and incoming auditors and the number of clients for every combination of them. Panel B provides univariate test results of whether clients with CEO/CFOs connected to XX auditor are more likely to hire XX as their external auditor. # (AudChg) is the number of auditor change. # (Hire) is the number of clients hiring the given auditor XX. % (Hire) is # (Hire) divided by # (AudChg). Difference is differences in % (Hire) between connected sample and unconnected sample. *, **, *** statistically different from zero (two-tailed) at the <0.10, <0.05, and <0.01 levels, respectively.

Table 3
Auditor Selection Analyses

Panel A. Descriptive Statistics

Variable	(1) <i>XX=PwC</i>		(2) <i>XX=EY</i>		(3) <i>XX=Deloitte</i>		(4) <i>XX=KPMG</i>	
	Mean	Std	Mean	Std	Mean	Std	Mean	Std
<i>XX</i>	0.245	0.430	0.405	0.491	0.265	0.442	0.324	0.468
<i>ConnXX</i>	0.093	0.291	0.109	0.312	0.057	0.233	0.078	0.268
<i>FBig4</i>	0.718	0.450	0.726	0.446	0.731	0.443	0.739	0.439
<i>MatchXX</i>	0.151	0.359	0.638	0.480	0.105	0.307	0.084	0.277
<i>SpecXX</i>	0.436	0.496	0.193	0.395	0.214	0.410	0.146	0.353
<i>AlumniXX</i>	0.119	0.324	0.115	0.320	0.074	0.262	0.078	0.268
<i>ACsize</i>	3.431	0.738	3.434	0.779	3.451	0.768	3.436	0.766
<i>ACexpertise</i>	0.308	0.226	0.315	0.229	0.310	0.219	0.312	0.230
N	461		476		485		499	

Panel B. Regression Results

Variable	(1) <i>Dep: PwC</i>		(2) <i>Dep: EY</i>		(3) <i>Dep: Deloitte</i>		(4) <i>Dep: KPMG</i>	
	Coeff.	P-value	Coeff.	P-value	Coeff.	P-value	Coeff.	P-value
Intercept	-1.599	0.011**	-1.069	0.039**	-1.749	0.002***	-1.289	0.010**
<i>ConnXX</i>	0.793	0.024**	1.163	0.001***	0.725	0.077*	0.252	0.4840
<i>FBig4</i>	0.360	0.1660	0.155	0.4810	1.043	0.001***	0.360	0.1240
<i>MatchXX</i>	0.300	0.3320	0.345	0.091*	0.891	0.008***	0.885	0.011**
<i>SpecXX</i>	0.318	0.1630	0.559	0.020**	-0.222	0.4350	0.362	0.1950
<i>AlumniXX</i>	0.745	0.019**	0.380	0.2000	0.462	0.2310	0.961	0.006***
<i>ACsize</i>	-0.162	0.3130	0.038	0.7650	-0.054	0.7020	0.065	0.6130
<i>ACexpertise</i>	1.188	0.016**	-0.214	0.6170	-0.130	0.7890	-0.582	0.1820
N	461		476		485		499	
Pseudo-R ²	0.044		0.042		0.050		0.038	

Panel C. Connected firms' audit quality and abnormal audit fees

Variable	Dep: <i>HiringConn</i>					
	(1)		(2)		(3)	
	Coeff.	P-value	Coeff.	P-value	Coeff.	P-value
<i>Intercept</i>	-6.165	0.009***	-6.010	0.011**	-5.513	0.034**
<i>ConnAQ1</i>	0.673	0.240				
<i>ConnAQ2</i>			0.201	0.603		
<i>ConnAQ3</i>					0.096	0.821
<i>ConnAbFees</i>	-0.275	0.084*	-0.262	0.096*	-0.219	0.216
<i>LogTA</i>	0.236	0.040**	0.257	0.024**	0.234	0.060*
<i>BankruptcyScore</i>	-0.014	0.746	-0.011	0.799	-0.001	0.980
<i>FBig4</i>	-0.480	0.290	-0.446	0.324	-0.542	0.281
<i>LitIndustry</i>	-0.023	0.951	0.005	0.989	0.298	0.461
<i>ACsize</i>	0.048	0.825	0.007	0.974	0.096	0.678
<i>ACexpertise</i>	-0.099	0.886	-0.137	0.842	-0.480	0.531
<i>SpecConn</i>	-0.105	0.799	-0.148	0.717	-0.281	0.557
<i>MatchConn</i>	0.791	0.025**	0.802	0.022**	0.781	0.045**
<i>AlumniConn</i>	-0.052	0.929	-0.020	0.973	0.285	0.666
<i>Dismissal</i>	0.344	0.653	0.309	0.685	-0.018	0.983
N		183		183		154
Pseudo-R ²		0.072		0.067		0.067

Panel A provides descriptive statistics for variables used in auditor selection analyses. Panel B reports the results of auditor selection regressions. The dependent variable *XX* (*PwC*, *EY*, *Deloitte*, or *KPMG*) is an indicator variable equal to one if the incoming audit firm is *XX*, and zero otherwise, where *XX* is PwC (PricewaterhouseCoopers), EY (Ernst & Young), Deloitte, or KPMG. *ConnXX* is an indicator variable equal to one if the CEO/CFO serves as an independent director of another firm who hires the auditor *XX*, and zero otherwise. Panel C provides the results of hiring a connected auditor. The sample consists of matched pairs of home and connected firms. *HiringConn* is an indicator variable equal to one if the home firm hires its connected auditor, and zero otherwise. *ConnAQ1* is an indicator variable equal to one if the connected firm does not misstate its financial statements in the past two years, and zero otherwise. *ConnAQ2* is an indicator variable equal to one if the connected firm does not meet or just beat zero earnings benchmarks in the past two years, and zero otherwise. *ConnAQ3* is an indicator variable equal to one if the connected firm's absolute performance-matched discretionary accruals belong to the lowest quartile, and zero otherwise. *ConnAbFees* is a quartile variable which is transformed from abnormal fees of the connected firm. *ConnAbFees* takes 0 (lowest quartile), 1, 2, and 3 (highest quartile). *, **, *** statistically different from zero (two-tailed) at the <0.10, <0.05, and <0.01 levels, respectively. Variable definitions are included in the Appendix.

Table 4**Descriptive Statistics for Variables Used in Audit Quality Analyses****Panel A. Audit Quality Variables**

Variable	N	Mean	P5	P25	P50	P75	P95
<i>Restatement</i>	1,352	0.132	0	0	0	0	1
<i>DecRestatement</i>	1,308	0.121	0	0	0	0	1
<i>MeetConsensus</i>	472	0.222	0	0	0	0	1
<i>MeetZero</i>	1,352	0.156	0	0	0	0	1
<i>/PMJDA/</i>	1,044	0.064	0.004	0.020	0.042	0.079	0.217
<i>/JDA/</i>	1,044	0.064	0.003	0.021	0.045	0.080	0.211

Panel B. Control Variables

<i>LogTA</i>	1,352	20.261	17.867	19.093	20.147	21.257	23.145
<i>ROA</i>	1,352	-0.018	-0.405	-0.041	0.030	0.081	0.188
<i>Market-to-Book</i>	1,352	2.756	0.141	1.235	2.131	3.450	8.741
<i>Leverage</i>	1,352	0.230	0.000	0.006	0.189	0.368	0.650
<i>Issue</i>	1,352	0.769	0	1	1	1	1
<i>NonAuditFeeRatio</i>	1,352	0.168	0	0	0	0	1
<i>MSALeader</i>	1,352	0.272	0	0	0	1	1
<i>NationalLeader</i>	1,352	0.252	0	0	0	1	1
<i>Cimportance</i>	1,352	0.087	0.003	0.011	0.028	0.099	0.329
<i>Big4</i>	1,352	0.889	0	1	1	1	1
<i>AlumniAud</i>	1,352	0.114	0	0	0	0	1
<i>CEOisChair</i>	1,352	0.532	0	0	1	1	1
<i>BDindep</i>	1,352	0.813	1	1	1	1	1
<i>ACsize</i>	1,352	3.525	3	3	3	4	5
<i>ACexpertise</i>	1,352	0.305	0	0	0	0	1
<i>AltmanZ</i>	1,044	3.022	-1	1	2	4	9
<i>StdCFO</i>	1,044	0.072	0	0.024	0.043	0.075	0.201
<i>LitIndustry</i>	1,044	0.266	0	0	0	1	1
<i>FirmAge</i>	1,044	22.332	6	11	16	33	55

Panel A provides descriptive statistics for audit quality proxies. The statistics for each variable is based on the sample for the respective analysis. Panel B provides descriptive statistics for control variables for audit quality analyses. The statistics for all variables with the exception of *AltmanZ*, *StdCFO*, *LitIndustry*, and *FirmAge* are based on the sample for the restatement analysis. Regarding *AltmanZ*, *StdCFO*, *LitIndustry*, and *FirmAge*, the statistics are based on the sample for the discretionary accruals analysis. Variable definitions are included in the Appendix.

Table 5
Regression of Restatement
(1)

Variable	(1)		(2)	
	Restatement		DecRestatement	
	Coeff.	P-value	Coeff.	P-value
<i>Intercept</i>	-2.999	0.189	-3.650	0.122
<i>Post</i>	-0.673	0.011**	-0.698	0.015**
<i>Treat</i>	-0.857	0.041**	-0.948	0.031**
<i>Post * Treat</i>	2.015	0.001***	2.232	0.001***
<i>LogTA</i>	-0.172	0.139	-0.152	0.220
<i>ROA</i>	-0.294	0.589	-0.299	0.596
<i>Market-to-Book</i>	0.017	0.424	0.016	0.500
<i>Leverage</i>	0.413	0.481	0.074	0.903
<i>Issue</i>	0.067	0.822	0.056	0.857
<i>NonAuditFeeRatio</i>	0.546	0.468	0.684	0.382
<i>MSALeader</i>	0.098	0.700	0.151	0.573
<i>NationalLeader</i>	0.451	0.073*	0.489	0.061*
<i>Cimportance</i>	-0.146	0.865	0.026	0.975
<i>Big4</i>	-0.817	0.026**	-0.797	0.043**
<i>AlumniAud</i>	-0.050	0.889	-0.067	0.852
<i>CEOisChair</i>	-0.329	0.197	-0.312	0.245
<i>BDindep</i>	-1.763	0.248	-2.398	0.127
<i>ACsize</i>	0.052	0.799	0.141	0.488
<i>ACexpertise</i>	-0.322	0.578	-0.026	0.966
<i>Industry fixed effects</i>		Yes		Yes
<i>Year fixed effects</i>		Yes		Yes
N		1,352		1,308
Pseudo-R ²		0.195		0.193

This table reports regression results of restatement on hiring connected auditors. *Treat* is an indicator variable equal to one if the firm switches to a connected auditor, and zero otherwise. *Post* is an indicator variable equal to one for the periods subsequent to auditor change, and zero otherwise. In Column (2), firms that have experienced income increasing restatements are excluded from the sample. *, **, *** statistically different from zero (two-tailed) at the <0.10, <0.05, and <0.01 levels, respectively. *P*-values are calculated using firm-clustered standard errors. Variable definitions are included in the Appendix.

Table 6
Regression of Meet/Beat Earnings Benchmarks

Variable	(1)		(2)	
	<i>MeetConsensus</i>		<i>MeetZero</i>	
	Coeff.	P-value	Coeff.	P-value
<i>Intercept</i>	-7.925	0.005***	-7.803	0.001***
<i>Post</i>	0.087	0.817	-0.501	0.024**
<i>Treat</i>	-1.545	0.120	-1.167	0.011**
<i>Post * Treat</i>	2.117	0.028**	1.134	0.013**
<i>LogTA</i>	0.159	0.256	0.167	0.061*
<i>ROA</i>	0.163	0.884	1.017	0.015**
<i>Market-to-Book</i>	-0.009	0.848	-0.015	0.493
<i>Leverage</i>	-1.058	0.120	1.177	0.023**
<i>Issue</i>	-0.182	0.699	-0.094	0.688
<i>NonAuditFeeRatio</i>	0.685	0.542	-0.473	0.394
<i>MSALeader</i>	0.005	0.990	0.063	0.786
<i>NationalLeader</i>	-0.038	0.922	-0.063	0.776
<i>Cimportance</i>	-0.134	0.895	0.711	0.201
<i>Big4</i>	-1.125	0.064*	-0.316	0.362
<i>AlumniAud</i>	0.073	0.875	0.049	0.863
<i>CEOisChair</i>	0.675	0.028**	-0.167	0.394
<i>BDindep</i>	1.602	0.400	-1.533	0.184
<i>ACsize</i>	0.004	0.986	0.120	0.311
<i>ACexpertise</i>	1.485	0.082*	-0.269	0.562
<i>Industry fixed effects</i>	Yes		Yes	
<i>Year fixed effects</i>	Yes		Yes	
N	472		1,352	
Pseudo-R ²	0.207		0.131	

This table reports regression results of meeting or beating earnings benchmarks on hiring connected auditors. *Treat* is an indicator variable equal to one if the firm switches to a connected auditor, and zero otherwise. *Post* is an indicator variable equal to one for the periods subsequent to auditor change, and zero otherwise. *, **, *** statistically different from zero (two-tailed) at the <0.10, <0.05, and <0.01 levels, respectively. *P*-values are calculated using firm-clustered standard errors. Variable definitions are included in the Appendix.

Table 7
Regression of Absolute Discretionary Accruals

Variable	(1)		(2)	
	/PMJDA/		/JDA/	
	Coeff.	P-value	Coeff.	P-value
<i>Intercept</i>	0.199	0.001***	0.189	0.001***
<i>Post</i>	-0.001	0.866	-0.001	0.842
<i>Treat</i>	-0.011	0.143	-0.012	0.129
<i>Post * Treat</i>	0.016	0.083*	0.016	0.091*
<i>LogTA</i>	-0.004	0.084*	-0.004	0.062*
<i>ROA</i>	-0.075	0.004***	-0.077	0.004***
<i>Market-to-Book</i>	0.001	0.188	0.001	0.084*
<i>Leverage</i>	0.022	0.211	0.022	0.196
<i>Issue</i>	-0.001	0.832	-0.003	0.625
<i>AltmanZ</i>	-0.001	0.469	0.000	0.626
<i>StdCFO</i>	0.014	0.158	0.011	0.342
<i>LitIndustry</i>	0.009	0.348	0.005	0.599
<i>FirmAge</i>	0.000	0.400	0.000	0.395
<i>NonAuditFeeRatio</i>	-0.009	0.540	-0.009	0.539
<i>MSALeader</i>	-0.011	0.017**	-0.009	0.049**
<i>NationalLeader</i>	0.006	0.218	0.007	0.176
<i>Cimportance</i>	-0.001	0.904	0.002	0.830
<i>Big4</i>	0.000	0.990	-0.002	0.865
<i>AlumniAud</i>	-0.004	0.530	-0.005	0.461
<i>CEOisChair</i>	-0.007	0.207	-0.007	0.161
<i>BDindep</i>	0.017	0.519	0.011	0.643
<i>ACsize</i>	0.004	0.174	0.004	0.165
<i>ACexpertise</i>	0.012	0.328	0.013	0.270
<i>Industry fixed effects</i>		Yes		Yes
<i>Year fixed effects</i>		Yes		Yes
N		1,044		1,044
Adjusted R ²		0.098		0.095

This table reports regression results of absolute discretionary accruals on hiring connected auditors. *Treat* is an indicator variable equal to one if the firm switches to a connected auditor, and zero otherwise. *Post* is an indicator variable equal to one for the periods subsequent to auditor change, and zero otherwise. *, **, *** statistically different from zero (two-tailed) at the <0.10, <0.05, and <0.01 levels, respectively. *P*-values are calculated using firm-clustered standard errors. Variable definitions are included in the Appendix.

Table 8
Audit Quality Analyses Using Propensity Score Matched Sample

Variable	Unmatched Sample					Propensity Score Matched Sample				
	Treatment Sample		Control Sample		Mean Difference	Treatment Sample		Control Sample		Mean Difference
	N	Mean	N	Mean	P-value	N	Mean	N	Mean	P-value
<i>LogTA</i>	52	21.098	286	20.079	0.001***	42	20.944	42	21.176	0.508
<i>ROA</i>	52	0.011	286	-0.025	0.241	42	0.004	42	0.029	0.481
<i>Market-to-Book</i>	52	3.019	286	2.694	0.572	42	2.946	42	3.090	0.849
<i>Leverage</i>	52	0.266	286	0.222	0.218	42	0.260	42	0.262	0.975
<i>Issue</i>	52	0.789	286	0.762	0.676	42	0.786	42	0.762	0.798
<i>NonAuditFeeRatio</i>	52	0.130	286	0.176	0.049**	42	0.143	42	0.139	0.902
<i>MSALeader</i>	52	0.289	286	0.283	0.940	42	0.238	42	0.286	0.625
<i>NationalLeader</i>	52	0.269	286	0.231	0.568	42	0.238	42	0.310	0.469
<i>Cimportance</i>	52	0.124	286	0.096	0.308	42	0.121	42	0.128	0.862
<i>Big4</i>	52	0.827	286	0.780	0.422	42	0.833	42	0.881	0.539
<i>AlumniAud</i>	52	0.058	286	0.101	0.244	42	0.048	42	0.119	0.242
<i>CEOisChair</i>	52	0.539	286	0.532	0.927	42	0.524	42	0.595	0.516
<i>BDindep</i>	52	0.816	286	0.814	0.913	42	0.811	42	0.821	0.662
<i>ACsize</i>	52	3.750	286	3.511	0.090*	42	3.762	42	3.857	0.669
<i>ACexpertise</i>	52	0.289	286	0.305	0.662	42	0.277	42	0.277	0.998
<i>AltmanZ</i>	38	2.326	223	3.315	0.027**	25	2.545	25	2.615	0.899
<i>StdCFO</i>	38	0.061	223	0.072	0.469	25	0.068	25	0.067	0.984
<i>LitIndustry</i>	38	0.211	223	0.278	0.363	25	0.160	25	0.240	0.490
<i>FirmAge</i>	38	25.316	223	21.251	0.146	25	27.880	25	23.440	0.314

Panel B. Restatement Analyses

Variable	(1)		(2)	
	<i>Restatement</i>		<i>DecRestatement</i>	
	Coeff.	P-value	Coeff.	P-value
<i>Post</i>	-1.059	0.292	-1.499	0.321
<i>Treat</i>	-4.451	0.003***	-6.304	0.003***
<i>Post * Treat</i>	6.235	0.001***	8.038	0.003***
Control Variables	Yes		Yes	
N	336		328	
Pseudo-R ²	0.642		0.732	

Panel C. Meet/Beat Earnings Benchmark Analyses

Variable	(1)		(2)	
	<i>MeetConsensus</i>		<i>MeetZero</i>	
	Coeff.	P-value	Coeff.	P-value
<i>Post</i>	0.666	0.723	-0.495	0.381
<i>Treat</i>	-1.239	0.545	-1.521	0.012**
<i>Post * Treat</i>	2.548	0.334	1.450	0.089*
Control Variables	Yes		Yes	
N	136		336	
Pseudo-R ²	0.498		0.325	

Panel D. Discretionary Accruals Analyses

Variable	(1)		(2)	
	<i>/PMJDA/</i>		<i>/JDA/</i>	
	Coeff.	P-value	Coeff.	P-value
<i>Post</i>	-0.012	0.475	-0.013	0.338
<i>Treat</i>	-0.030	0.039**	-0.034	0.007***
<i>Post * Treat</i>	0.034	0.080*	0.038	0.024**
<i>Control Variables</i>	Yes		Yes	
N	200		200	
Adjusted-R ²	0.181		0.241	

Panel A reports mean differences in independent variables of audit quality models between the treatment and control samples before and after propensity score matching. For these comparisons, we use observations in the year prior to auditor change. The statistics for all variables, except *AltmanZ*, *StdCFO*, *LitIndustry*, and *FirmAge* are based on the sample for the restatement analysis. Regarding *AltmanZ*, *StdCFO*, *LitIndustry*, and *FirmAge*, the statistics are based on the sample for the discretionary accruals analysis. Panel B (Panel C and Panel D) reports regression results of the restatements (meet/beat earnings benchmarks and absolute discretionary accruals) analysis using propensity-matched samples. To obtain matched samples, the propensity score is calculated from the logistic model where the dependent variable is equal to one if the firm hires a connected auditor, and zero otherwise, and the independent variables are extracted from the respective audit quality regression model. Variable definitions are provided in the Appendix.

Table 9

Additional Effect of Connections through either the Same Office or Audit Committee

Panel A. Restatement Analyses

Variable	(1)		(2)	
	<i>Restatement</i>		<i>DecRestatement</i>	
	Coeff.	P-value	Coeff.	P-value
<i>Post * Treat (Same Off or AC)</i>	2.299	0.001***	2.534	0.001***
<i>Post * Treat (Others)</i>	0.456	0.621	0.657	0.484
<i>Control Variables</i>	Yes		Yes	
N	1,352		1,308	
Pseudo-R ²	0.198		0.196	
Wald test: <i>Post * Treat (Same Off or AC) = Post * Treat (Others)</i>				
Difference in coefficient (P-value)	1.843	(0.067)*	1.877	(0.063)*

Panel B. Meet/Beat Earnings Benchmark Analyses

Variable	(1)		(2)	
	<i>MeetConsensus</i>		<i>MeetZero</i>	
	Coeff.	P-value	Coeff.	P-value
<i>Post * Treat (Same Off or AC)</i>	3.151	0.001***	1.004	0.071*
<i>Post * Treat (Others)</i>	-0.281	0.876	1.390	0.065*
<i>Control Variables</i>	Yes		Yes	
N	472		1,352	
Pseudo-R ²	0.213		0.132	
Wald test: <i>Post * Treat (Same Off or AC) = Post * Treat (Others)</i>				
Difference in coefficient (P-value)	3.431	(0.071)*	-0.387	(0.674)

Panel C. Discretionary Accruals Analyses

Variable	(1)		(2)	
	<i>/PMJDA/</i>		<i>/JDA/</i>	
	Coeff.	P-value	Coeff.	P-value
<i>Post * Treat (Same Off or AC)</i>	0.016	0.119	0.014	0.227
<i>Post * Treat (Others)</i>	0.014	0.324	0.024	0.102
<i>Control Variables</i>	Yes		Yes	
N	1,044		1,044	
Adjusted R ²	0.096		0.094	
Wald test: <i>Post * Treat (Same Off or AC) = Post * Treat (Others)</i>				
Difference in coefficient (P-value)	0.002	(0.905)	-0.010	(0.545)

This table reports regression results of audit quality proxies on hiring auditors connected through either the same office or CEO/CFOs' AC membership in connected firms. *Treat (Same Off or AC)* is an indicator variable equal to one if the firm switches to a connected auditor through either the same audit office or AC membership, and zero otherwise. *Treat (Others)* is an indicator variable equal to one if *Treat* is equal to one and *Treat (Same Off or AC)* is equal to zero, and zero otherwise. *Post* is an indicator variable equal to one for the periods subsequent to auditor change, and zero otherwise. *, **, *** statistically different from zero (two-tailed) at the <0.10, <0.05, and <0.01 levels, respectively. P-values are calculated using firm-clustered standard errors. Variable definitions are included in the Appendix.

Table 10
Comparison of audit fee metrics

	Hiring a connected auditor		Hiring a non-connected auditor		Diff.	<i>p</i> -value
	N	Mean	N	Mean		
Panel A. Home firms						
<i>Changes in log (audit fees)</i>	93	0.228	150	0.114	0.114	0.167
<i>Changes in abnormal audit fees</i>	89	0.002	151	-0.127	0.129	0.047**
<i>Changes in log (total fees)</i>	93	0.202	156	0.076	0.126	0.075*
<i>Changes in abnormal total fees</i>	89	-0.010	157	-0.137	0.127	0.028**
Panel B. Connected firms						
<i>Changes in log (audit fees)</i>	88	0.281	162	0.145	0.136	0.057*
<i>Changes in abnormal audit fees</i>	79	0.088	163	0.006	0.082	0.099*
<i>Changes in log (total fees)</i>	88	0.253	168	0.065	0.188	0.007***
<i>Changes in abnormal total fees</i>	79	0.076	149	-0.034	0.110	0.023**

This table reports results for univariate comparison of changes in fee metrics. Panel A compares the changes for home firms hiring a connected auditor with those for firms hiring a non-connected auditor. Panel B compares the changes for connected firms whose home firms hire a connected auditor with those whose home firms hire a non-connected auditor. *, **, *** statistically different from zero (two-tailed) at the <0.10, <0.05, and <0.01 levels, respectively.