Revisiting the effects of industry expertise on audit pricing*

John Goodwin

Associate Professor
Sabancı University
Istanbul, Turkey
E-mail: goodwin@sabanciuniv.edu
Tel: 90-0216 483 9675
Fax: 90-0216 483 9699

Donghui Wu

Associate Professor
The Chinese University of Hong Kong
Hong Kong SAR, China
E-mail: donghui.wu@cuhk.edu.hk
Tel: 852-2609 8516
Fax: 852-2603 5114

Abstract Several studies report an audit fee premium for auditor industry expertise measured at the office-level. We extend this line of research by examining whether there is a fee premium for auditor industry expertise measured at the partner level. We show that the coefficient for partner-level industry expertise is highly significant and economically important. This is consistent with industry knowledge or expertise residing in the human capital of individual engagement partners. Inconsistent with prior research, we show that there is no auditor industry expertise fee premium at the audit office level when expertise at the partner-level is controlled for. Consistent with prior research we find little evidence of a fee premium at the national level. In sum, our results show that the auditor industry expertise fee premium is mainly a partner-level phenomenon, casting doubt on the belief that industry knowledge or expertise is distributed across engagement partners within an audit office.

Keywords Audit fee premium; Industry expertise; Engagement partner; Audit office

JEL classification M41, M42

* We thank Mike Bradbury, Simon Fung, Ferdi Gul, Bingbing Hu, Jay Lee, Kenny Lin, and Zhifeng Yang for their helpful comments on this paper.

Revisiting the effects of industry expertise on audit pricing

> [T]he ultimate decisions must be left to the people who are familiar with these circumstances, who know directly of the relevant changes and of the resources immediately available to meet them. We cannot expect that this problem will be solved by first communicating all this knowledge to a central board ... We must solve it by some form of decentralization. ... We need decentralization because only thus can we ensure that the knowledge of the particular circumstances of time and place will be promptly used.
>
> —Hayek (1945, p.524)

1 Introduction

Since Francis et al. (1999) and Reynolds and Francis (2001), audit researchers have changed the level of analysis of auditor behavior from the audit firm (firm) to the audit office (office) (e.g., Craswell et al. 2002; Chung and Kallapur 2003; Krishnan 2005; Gaver and Paterson 2007; Francis and Yu 2009; Choi et al. 2010). The premise underlying this change is that audit contracting occurs at the office level and actual audit quality of financial statements can vary widely across offices within the firm. But according to the opening quote, decentralizing decision rights to individuals who have the relevant knowledge and capabilities improves efficiency. Because client-specific knowledge is an important input to auditor's decision-making, it follows that in practice, key decisions such as pricing could be made by the engagement partner (partner), who is likely the most familiar with his client.[1] Consistent with this argument, DeFond and Francis (2005) suggest that extending the level of analysis to the partner level could provide a better understanding of auditor behavior. Recent studies have used partner-level data to investigate auditor tenure (Carey and Simnett 2006; Chen et al. 2008), client importance (Chen et al. 2010; Chi et al. 2012), and attributes of audited financial statements (Gul et al. 2011). Generally, these studies find that audit outcomes vary across partners, suggesting that partners' incentives and expertise could differ from those of the firm and the office.

[1] The male pronoun is used in this study because for the 2003 to 2010 years, male audit partners signed about 90 percent of the audit reports issued by the Big 4 (N = 6,612 client years). The corresponding perentage for the non-Big 4 is about 97 (N = 6,928 client years).

Following a similar path, early studies on audit pricing find that Big N firm fees are higher than those of non-Big N firms and this fee premium is interpreted as positive returns to the Big N's investment in brand name reputation for higher audit quality (Francis 1984; Francis and Stokes 1986; Palmrose 1986; Francis and Simon 1987). Subsequent studies find that by developing their industry-specific skills and expertise, Big N industry specialists command an industry-specific premium over non-specialists in addition to the general brand name premium (Craswell et al. 1995; Hogan and Jeter 1999; DeFond et al. 2000). While these studies recognize that Big N firms are different from each other with respect to industry specialization, the authors measure industry expertise at the firm level and assume that industry knowledge/expertise can be transferred between local offices within the firm. Ferguson et al.'s (2003) seminal paper adopts an innovative design by viewing city-specific or local office industry market share as a relevant basis for determining industry expertise. Using Australian data, they find that auditors earn a premium when they are both the national and office-specific industry leader, but firms that are national industry leaders do *not* earn a premium in cities where they are not the office leader. This suggests that industry expertise should be better viewed as an office rather than a firm phenomenon. Despite the differences in geographic dispersion and the degree of decentralization of Big N's operations between the U.S., the U.K. and Australia, evidence from the U.S. (Francis et al. 2005) and the U.K. (Basioudis and Francis 2007) also supports the office-level view of the industry expertise premium. The common theme in these studies is that office specialization is a necessary condition for the industry expertise fee premium.

The central issue in the firm-level *versus* office-level perspective on industry expertise is the transferability of auditor expertise, i.e., whether accounting firms can effectively distribute office-specific industry expertise to other offices throughout the firm's network and thus earn the benefits of firm-level reputation for industry expertise. Although the overall evidence does not support the firm-level view in that national industry leadership alone is not associated with a premium, the above studies find that there is a premium when auditors are jointly the city and national industry leader. This raises the possibility that there could be some weak form of knowledge transfers across offices (Basioudis and Francis 2007). More importantly, even if a premium for industry expertise is viewed as only office-specific, one needs to assume that industry expertise and the fee premium is not limited to specific engagements administered by expert partners, but can be transferred intra-office to non-expert partners when they audit clients in industries where the expert partners have developed their expertise and built their reputations. This

transferability allows an office to earn premiums for engagements where industry experts are not actually involved.

The present study extends this from-firm-to-office logic further to the partner level. Using data from Australia where disclosure of partner is mandated,[2] we directly test whether the audit fee premium is specific to partners who are industry specialists or whether it represents general returns to firm/office's investments in industry specialization. Our sample consists of 6,042 client-year observations audited by Big 4 firms from 2003 to 2010.[3] We find that there is a fee premium for engagements where the signatory partners are industry leaders and that this premium is independent of whether the firms or offices are industry leaders. Depending on the model specification, this premium averages 41 percent to 132 percent. Most important, once we control for the effects of partner-level leadership on audit pricing, the magnitude of the premium for office or joint national-office leadership declines substantially and generally becomes insignificant. These findings are robust to different model specifications, estimation methods, time periods, and an alternative industry classification scheme.

Our key finding is that firm or office-level leadership is neither necessary nor sufficient for auditors to earn a fee premium. Rather, individual partner-level specialization is a sufficient condition for a fee premium. Therefore, neither the firm-level nor office-level view is descriptive of how Big 4 accounting firms operate. Our finding also highlights the fact that industry expertise is quite individual-specific and casts doubt on the transferability of expertise across partners within the office, a commonly-held belief in the prior literature. This new evidence represents an important step in understanding the nature of auditor industry expertise.

We also find prior studies have significantly underestimated the fee premium for industry expertise. The average premium for the joint national-city industry leadership is between 24 percent and 19 in the

[2] Section 324 AB(3) of the Corporations Act 2001 requires the audit report to be signed in the names of the audit partner and the audit firm.

[3] The data reveal that industry leadership at the firm/office-level is not tantamount to partner-level leadership, especially in the Big 4 audit firms. Among the observations that are audited by national, city, or partner industry leaders, about 69 percent of audits are performed by national and/or city leaders but the engagement partners are not the industry leaders (N = 13,540 client years). The equivalent percentage for the Big 4 sample is 77 (N = 6,612 client years).

literature (Ferguson et al. 2003; Francis et al. 2005; and Basioudis and Francis 2007). Using almost the same sample and model specification to Ferguson et al. (2003), we estimate a partner-leader fee premium of about 44 percent.[4] Since partners who are not industry leaders do not command a fee premium when they work in office or national leaders, pooling these partners with the industry leader partners results in misspecified statistics and understates the magnitude of the fee premium. The implication is that measuring industry expertise at the partner level reduces measurement errors and increases the power of tests.

In a recent study, Zerni (2012) documents the audit fee premium associated with industry leadership at the partner level in Sweden. The present study differs from Zerni (2012) in the focus of analysis. We closely follow the research design initiated by Ferguson et al. (2003) and used in subsequent studies (Francis et al. 2005; Basioudis and Francis 2007). Our design tests whether the fee premium can be viewed as a firm- or office-level or a partner-specific phenomenon. By contrast, Zerni (2012) examines whether auditor specialization is priced at the partner level. He controls for the possible firm/office effects on audit pricing by including firm and office fixed effects in regressions. Although this design controls for firm or office-level effects on audit pricing, it does not allow us to infer whether the fee premium exists only at the partner level or it co-exists with the premium due to industry leadership at the firm or office-level.[5] Using the original design of Ferguson et al. (2003), we are able to show that the pricing of industry expertise is mainly a partner-specific phenomenon and there is no strong evidence of knowledge transfer between partners within the same firm/office. Our evidence sheds new light on the nature of reputations for industry expertise and enhances our understanding of the operations of Big 4 accounting firms.

---

[4] The results are reported in section 5.1.3.

[5] In fact, adding the firm and office fixed effects to the audit fee regressions does not completely mitigate the possible effects of firm or office industry leadership on audit fees. This is because such fixed effects represent the average fee premium or discount across all the industries audited by the audit firm or office. Given that audit firm or office typically has clients from multiple industries and could be leaders in some of them, the fee differences attributable to firm/office industry leadership would become the regression residuals or be picked up by the partner leadership indicator to the extent that the indicator is positively correlated with omitted indicators for industry leadership at the firm/office level. In his additional analyses, Zerni (2012, p.336) controls for industry leadership effects on audit fees by estimating a regression with office and industry fixed effects. However, results for these fixed effects regressions are not provided, and neither is information on industry leadership at the audit office level. As a result, one cannot determine whether the audit market prices partner leadership alone or whether it also prices office leadership.

Moreover, there are important differences between the Australian and Swedish audit markets. As Bedard (2012) notes, the nature of Zerni's (2012) sample leads to concerns about reliability of the results and generalizablity of the findings, and she calls for more research in other jurisdictions. We believe Australia to be an appropriate setting to revisit the pricing of industry expertise for the following reasons. First, the Australian audit market is much larger and more geographically dispersed than Sweden's.[6] In our sample, both clients and auditors are widely distributed across the five cities and industry groups, while over fifty percent of clients are audited by offices in the city of Stockholm in Zerni's (2012) sample. Theoretically, the greater dispersion allows the local offices and partners to develop their unique expertise that differs from expertise at the firm-level and office-levels. In our tests, we are able to form reasonable-sized sub-samples according to different combinations of industry leadership at firm, office, and partner levels. Therefore, the greater variability of Australian data makes it possible to examine the interplay between the effects of firm, office, and partner-level industry leadership on audit pricing.

Second, Australian data permit a replication of the first study on the fee premium for industry leadership at the office-level, namely Ferguson et al. (2003), which establishes that city level expertise is associated with a fee premium in Australia. We are able to replicate Ferguson et al.'s (2003) results in both their sample period (fiscal 1998) and a more recent time period (fiscal 2003-2010), when the Australian audit market has experienced a noticeable change in Big 4's market share in terms of number of clients. This ability to replicate this important study is crucial: we can clearly demonstrate that the different results between Ferguson et al. (2003) and the current study are not caused by differences in sample compositions or research design choices. Rather, the fee premium paid to joint city and national leaders as documented by Ferguson et al. (2003) is actually a manifestation of the premium for industry expertise specific to individual partners.

Third, consistent with Ferguson et al. (2003), evidence from U.S. (Francis et al. 2005) and U.K. (Basioudis and Francis 2007) also supports the office-specific view of industry expertise. Although we do not corroborate our findings with data from these countries, our results should have better potential to be generalized to these important markets as compared with Zerni (2012). Australia, U.K., and U.S. all belong

[6] The average number of clients per year in Zerni (2012) is about 172, compared with about 755 clients per year in our sample. There are 395 unique partners in our sample and 171 in Zerni (2012).

to the same legal family, namely the English common law. In general, these countries share a similar legal environment and are close to each other in important institutional arrangements with respect to investor protection, whereas Sweden differs by having a Scandinavian legal origin that is inferior to English common law in protecting investors (La Porta et al. 1997 and 1998). Consistent with the notion that country-level institutions determine accounting practice, evidence from cross-country studies suggests that Australia, U.S., and U.K. are more homogenous in the attributes of financial reporting and audit market development, while Sweden tends to be different from common law countries in the above respects (Ali and Hwang 2000; Hung 2001; Bhattacharya et al. 2003; Leuz et al. 2003; Francis et al. 2003). We believe that the Swedish evidence is important in understanding auditor behavior in Sweden and other countries with similar legal infrastructures. However, Australian evidence has the merits of enhancing the generalizablity of findings from the current study to other common law countries, which have much larger capital markets than countries with other legal origins (La Porta et al. 1997) and stronger demand for independent audit services as a consequence (Francis et al. 2003).

The remainder of the paper is organized as follows. The next section reviews relevant theories and presents the research question. The sample and data are described in Section 3, followed by research methods in Section 4. Results of the primary and additional tests are reported in Section 5. The paper concludes with a discussion of the study's implications.

2 Theoretical background and research question

The agency and contracting literature suggests that accounting-based contracts can be used to reduce agency costs associated with the client, and auditors provide assurance of the integrity of accounting numbers produced by the client's accounting system so that such numbers can be used in the contracting process (Jensen and Meckling 1976; Watts and Zimmerman 1986). To effectively render assurance services, auditors should command knowledge that is specific to engagements, in addition to the generic knowledge base that is required for all audits. This specific knowledge includes the client's accounting and internal control systems, specialized accounting rules and reporting requirements, economic activities, contractual arrangements, ownership structure, and the nature of agency conflicts between contracting parties (Craswell et al. 1995). Acquiring such specific knowledge improves auditors' ability to identify

accounting irregularities and breaches of contracts, and thus strengthens the role of auditing, as a credible bonding or an effective monitoring mechanism, in reducing agency costs.

However, evidence from audit judgment research suggests that it is costly to produce and transfer client-specific knowledge. In general, auditors' performance is related to years of experience (Frederick and Libby 1986). Moreover, auditor expertise is strongly associated with the client-related knowledge acquired from client- or industry-specific experience (Bonner and Lewis 1990). These findings suggest that it takes time for auditors to gain knowledge and build expertise from actual experience with specific types of engagements. Audit judgment research also shows that such knowledge cannot be directly transferred between auditors. For example, Bonner and Walker (1994) demonstrate that, without experience through practice and feedback, general instruction *per se* does not produce knowledge in trainee auditors. Based on a review of studies from several disciplines, Vera-Muñoz et al. (2006) also discuss a variety of factors that may impede auditors from sharing knowledge within firms.[7] Using semi-structured interviews and survey data, Chow et al. (2008) find that barriers to knowledge sharing between auditors are not rare in Big 4 firms.

When specific knowledge is important for decision making and costly to transfer, it is optimal for an organization to delegate the decision rights to lower levels where more relevant specific knowledge is located, i.e., the organization should be more decentralized (Jensen and Meckling 1992). Fama and Jensen (1983a and 1983b) argue that a public accounting firm is generally organized as a partnership, because this structure is most efficient for using specific knowledge possessed by the partners locally. In partnerships, partners contract for audits with clients, administer the audit engagements, and play major decision-making roles. Moreover, in regimes where the partner signature is required, individual partners are explicitly accountable for the final audit reports that they sign. The autonomy allowed for partners suggests that accounting firms or offices play a less important role in administering audit engagements. Therefore, actual audit outcomes are expected to vary with partners' characteristics, including their expertise.

[7] These factors include the inadequacy in audit firms' information technology to encourage effective knowledge sharing among their personnel, time constraints and workload pressure that reduce knowledge sharing efforts, lack of communications among auditors, and exclusive reliance on individual-based, extrinsic reward systems.

Then in a highly decentralized accounting firm, how is the autonomous partner, who is self-interested as any economic agent, incentivized to build his expertise and improve audit quality? Fama and Jensen (1983b) discuss ownership arrangements that address the interest alignment problem in partnerships. Different from open corporations, in professional partnerships, residual claims are restricted to partners who have major decision-making roles in practice. Partners have claims over the difference between inflows of resources and promised payments and at the same time, bear the corresponding risks. Moreover, a partner's residual claim is generally not a fixed share but can be renegotiated periodically according to his past and expected future performance. With these flexible sharing rules, a partner's payoff is calibrated to reflect the contributions of his human capital. This adds to his incentives to gather client-specific knowledge and develop his specialized skills to differentiate from external competitors or gain competitive advantage over his internal rivals.

Given that clients' agency problems and solutions via accounting have some common industry features, it is cost efficient for partners to specialize in industries and build industry-based clienteles (Craswell et al. 1995). Investments in industry specialization leads to product differentiation: relative to non-specialists, specialists are able to offer better quality audit services and a higher level of assurance, which reduces clients' agency costs. Provided that the benefits from reduced agency costs outweigh the higher audit costs, clients are willing to purchase audit services from industry specialists by paying higher fees.[8, 9] The ability to earn a fee premium for industry expertise compensates partner's investments in specialization and enhances the value of his human capital. Thus we expect a partner-specific element of the audit fee premium for industry expertise.

While the audit literature has recognized the difficulty in sharing knowledge among individual auditors, *a priori* we do not know the extent to which industry expertise is transmitted between partners.

[8] That is, product differentiation through industry specialization leads to higher-priced audit services. An alternative view is that specialization creates scale economies, which result in lower audit fees if efficiency gains are passed on to clients (Simunic 1980). Empirical studies generally find that the product differentiation effect dominates the scale economies effect, but scale economies are observed under certain conditions (Cahan et al. 2011; Fung et al. 2012).

[9] Therefore, the audit fee premium can be viewed as the market's pricing of audit quality. Whether the engagement partner has the autonomy to make the audit pricing decision is irrelevant to the partner-specific *versus* firm/office-level analysis of the fee premium. Nonetheless, Bedard and Johnstone (2004) suggest that audit pricing decisions are made by individual members of engagement teams.

Ferguson et al. (2003) suggest that firms may build firm-level reputations for industry expertise through standardized training and audit programs, peer reviews and by travel by industry experts between offices. Arguably, these methods should be even more effective in facilitating transfer of expertise between partners within the office. For example, geographic distance between offices is not an impediment to knowledge sharing between partners within the office.[10] In arguing for a partner element of industry expertise, we cannot rule out the presence of an office- or firm-level audit fee premium for industry leadership. These competing views lead to our research question:

> **Research question:** Is industry expertise at the partner level *independently* associated with an audit fee premium, or does expertise at the firm-, office-, and partner-levels *jointly* affect audit pricing?

3 Sample and data

We use hand collected and electronic data for all 13,540 Australian Stock Exchange (ASX) listed clients for the 2003 to 2010 fiscal years, obtained from the ASX website and the Morningstar *Finanalysis* database. Our sample period starts with fiscal years beginning on 1 July 2002, the date when the ASX began using the Global Industry Classification Standard (GICS).[11] Clients are assigned to an industry using this classification scheme. When a client's financial statements are not expressed in Australian dollars, which occurs for less than 1 percent of the sample, the financial statement numbers are converted into Australian dollars using the average spot rate of foreign exchange over that fiscal year. Following prior studies, regressions are estimated only on the clients audited by Big 4 auditors to reduce the possible adverse effects of self-selection of a Big 4 auditor (Ferguson et al. 2003; Francis et al. 2005). Following Ferguson et al. (2003), we only examine the largest five Australian cities, namely Adelaide, Brisbane, Melbourne, Perth, and Sydney, to reduce the effect of extreme values of market share when the number of clients is small. Untabulated statistics show that over 98 (97) percent of audit fees (clients) nationally is

[10] Further, given the benefits for audit quality from reputations for industry expertise, the accounting profession should have strong incentives to develop solutions to this transferability problem. For example, audit firms may take advantage of recent advances in information technology to develop more effective solutions to the knowledge sharing problem. This also supports a re-examination of this issue with more recent data.

[11] Up to 30 June 2002 the ASX used its own 24 industry sectors to classify listed clients. We use the 24 GICS industry groups to classify listed clients.

attributed to these five cities in the sample period. As we also use client and partner fixed effects regressions, we require that each client and each partner have available data for at least two consecutive years in the sample period. The final sample totals 6,042 client years after imposing these data screens.

Table 1 about here

About 49 percent of listed clients in the largest five cities are audited by the Big 4 firms (untabulated). Because Ferguson et al. (2003) report a percentage of 65 using data from 1998, we examine the validity of using the Big 4 firms as the population comprising the audit experts. Panel A of Table 1 shows the Big 4s' market shares of fees and clients, for all listed clients in Australia and the U.S.[12] For this comparison, we use total audit fees paid to all auditors of the entity for consistency with the measurement of U.S. audit fees from the Audit Analytics® database.

As Ferguson et al. (2003 p.439) note, the percentage of clients audited by the Big N is lower in Australia than in the U.S., with the differences ranging from about 4 percentage points in 2006 to about 16 in 2010. These percentages also show that the Australian and U.S. Big 4 firms have shed clients up to 2009 and 2008, respectively (Hogan and Martin 2009; Landsman et al. 2009). In both countries, there is a general decline in the Big 4's share of audit fees, although this decline is slightly higher in Australia at about 3 percentage points down to about 87 percent in 2010, compared to a decline of about 1 percentage point, down to about 94 percent for the U.S. in 2010.[13] Over the sample period, the percentage of fees paid to the Australian Big 4 firms is about 89 compared to about 94 in the U.S. (untabulated).[14] Because the Australian percentages are lower than in the U.S. and lower than those reported in Ferguson et al. (2003), we show the next highest Australian audit firm by share of fees in Panel B, to examine whether other firms have large market shares. It is evident that no auditor other than the Big 4 has a material share of fees, with

[12] The sample size for Australia (U.S.) totals 13,540 (109,753) client years.

[13] For the years 2003 through 2010 respectively, these year percentages are: 89, 89, 88, 89, 89, 88, 86, 86, if, instead, we use audit fees paid to the auditor of the parent entity. See footnote 21.

[14] This percentage is 88 using audit fees paid to the auditor of the parent entity. See footnote 21.

the maximum percentage of about two shared between three different auditors over the sample period.[15] We conclude that it is still appropriate to use the Big 4 audit firms as the population comprising the audit experts.

Panel A of Table 2 shows market shares at the audit firm and partner levels, nationally and by major Australian city, for the Big 4 audit firms and the top four ranked partners. The four columns on the far right show that at the national level, PriceWaterhouseCoopers (PW) has the largest market share at about 28 percent and two PW partners account for about six percent of fees. The firms of PW, Ernst & Young (EY), KPMG (KP) and their partners, always occupy the top three positions in each city, and Deloitte Touche Tohmatsu (DT) ranks fourth in all cities except for Brisbane and Adelaide. DT ranks fifth in Brisbane with about 3 percent and fifth in Adelaide with about eight percent (untabulated).[16] In Brisbane, about 56 percent of fees are attributed to four partners, and the corresponding percentages for Adelaide, Perth, Melbourne, and Sydney are 46, 29, 22, and 16, respectively.

Panel B of Table 2 shows the firm and partner market shares for the 24 GICS industry groups. Cases where the lead firm and partner differ are shown in bold face type. Nationally, the lead partner works in the lead firm in 14 of the 24 industries, and about 38 percent of his firm's national market is attributed to him (untabulated).[17] There are no valid observations for seven of the maximum 120 city-industry combinations giving 113 city-industries.[18] The national leader firm is the city leader in 45 city-industries, or a

[15] The Auditor-General of Australia is a public sector employee from the Australian Government's National Audit Office (NAO), and he signed the audit report of Telstra Corporation limited (TLS) for the years before 2007. The NAO was appointed auditor of TLS under section 36(3) of the Telstra Corporation Act 1991. As the largest telecommunications company in Australia, TLS ranks in the top percentile of audit fee paying clients in each of the 2003 to 2010 years. The auditor general appointed an audit firm as his agent, to assist in performing independent external audit duties. In November 2006, the Auditor-General resigned as auditor and Ernst and Young became the signatory of the audit report and the sole auditor of TLS. We therefore assign the NAO as the auditor of TLS for the years before 2007. However, for our replication of Ferguson et al.'s (2003) results (see section 5.1.3), we classify the TLS auditor as the Auditor-General's agent (PriceWaterhouseCoopers at that time), following Ferguson et al. (2003).

[16] We do not round the market shares in determining ranks, but the Table 2 data are shown to zero decimal places for brevity. Rounded to 2 decimal places, BD's (DT's) market share in Brisbane is 3.19 percent (3.12 percent).

[17] For these 14 industries, the mean of the ratios of partner market share nationally to firm market share nationally is about 38 percent and the median is about 33 percent.

[18] There are 24 GICS industry groups and five cities giving a maximum of 120 city-industries.

percentage of about 40. Using Australian data from 1998, Ferguson et al. (2003) report a percentage of 44, although Ferguson et al (2003) use audit fees paid to all auditors of the client's group. If we use their audit fee measure, the percentage is 42 (48 city-industries), which is quite close to Ferguson et al.'s (2003) number.

Table 2 about here

At the city level, the lead firm and partner are the same in 92 of the 113 city-industries. For these 92 city-industries, about 62 percent of the firm's city market share is attributable to one partner, suggesting that partner and city level market shares could be strongly positively correlated.[19] There are three, seemingly erroneous cases where a partner's market share is larger than his firm's market share in the same city (i.e. Retailing for Perth, Household & Personal Products for Melbourne, and Technology, Hardware & Equipment for Perth). However, these cases occur because the partner market shares reported in Table 2 are calculated on the pooled sample rather than for each year and these statistics are not calculated within firm. During the sample period, there are six partner leaders who worked for more than one firm and for these cases we report the most recent firm that the partner worked for.[20] For our regression analysis, we calculate partner market shares each year and there are no cases where a partner's market share is larger than his firm's city market share.

As the number of unique partners is 925 over the sample period (untabulated), these partner share statistics indicate that a large market share is attributed to a relatively small number of partners at the national and city levels. These statistics also suggest that partner industry expertise could be an important, omitted variable, from models used to examine the audit fee and city auditor expertise relation in prior studies (Ferguson et al. 2003; Francis et al. 2005; Basioudis and Francis 2007).

[19] For these 92 city-industries, the mean of the ratios of partner market share at the city level to firm market share at the city level is about 62 percent and the median is about 57 percent.

[20] A merged firm is treated as a different firm to the pre-merged firms because a partner's incentives for audit quality could be different in the merged firm (Chan and Wu 2011).

4 Research methods

To examine whether industry leadership at the partner, city, and national levels is associated with an audit fee premium, we estimate the following OLS regression:

$$LAF = \alpha + \sum\beta_i * Experimental\ Variables + \sum\gamma_i * Control\ Variables + \sum\kappa_i * Industry\ Fixed\ Effects + \sum\lambda_i * Year\ Fixed\ Effects + \varepsilon, \quad (1)$$

where the dependent variable *LAF* is the natural logarithm of audit fees (in 1,000 AUD) paid to the auditor of the parent entity. While prior studies generally use the natural logarithm of total audit fees (*LAF_ALL*), we believe that *LAF* is a better measure of an auditor's market share than is *LAF_ALL*, as *LAF_ALL* includes fees paid to other audit firms and offices, within and outside Australia.[21] Specifically, for a single firm, office or partner, the three market share measures will be overstated using total fees, *ceteris paribus*. Other things are unlikely to be equal however, because other firms, offices and partners' market shares are also likely to change using total fees. Thus the bias in the measurement of market shares using total fees is unclear.[22] Nevertheless, in our replication of Ferguson et al (2003), we use *LAF_ALL*. In our panel dataset, audit fees could be correlated within a client over time and/or within a period across clients. We therefore correct the standard errors for both cross-sectional and time-series dependence as per Gow et al. (2010).

4.1 Experimental variables

Consistent with prior auditor expertise research, we consider industry experts to be those auditors with a large market share. Market share is a reasonable proxy for industry expertise because auditors are

[21] Note that fees paid to the auditor of the parent entity, comprises fees paid for auditing the parent entity and for auditing any subsidiaries of the parent. We acknowledge that fees paid to other auditors within Australia are not allocated to those auditors and that fees paid for auditing unlisted entities are not allocated to auditors. These fees cannot be allocated due to data limitations. These data limitations are present in the other auditor expertise studies referred to in the present paper.

[22] We do, however, expect that using parent auditor fees will be relatively more accurate for large clients, because large clients are more likely to have overseas auditors involved in auditing entities in the group, and these auditors can be paid large fees. Consistent with this contention, for the bottom quartile (using total assets to measure size) of Big4 clients (N = 1,653), the correlation coefficients for the two alternate fee measures are all above 0.96 for each of the three market share measures, but the coefficients range from 0.92 (national market share measures) to 0.97 (partner market share measures) for the top quartile of clients. Although 0.92 is still a strong correlation, these correlations are on the pooled sample across the five cities, meaning that the city-level correlations will likely be weaker, especially when a single client accounts for a large portion of the city-industry fees and that client has a large portion of its fees paid to an overseas auditor.

able to gain experience and increase their knowledge by performing more audit works in the same industry (see, e.g., Craswell et al. 1995). Two sets of tests are used to examine the incremental importance of auditor expertise at the partner, city, and national levels in explaining audit fees. First, the experimental variables are market shares measured at the national, city, and partner levels for each industry-year. Specifically, in our "market share" model the experimental variables are defined by the following equations:

$$MSHARE\_NAT_{ik} = \frac{\sum_{j=1}^{J_{ik}} AF_{ijk}}{\sum_{i=1}^{I_k}\sum_{j=1}^{J_{ik}} AF_{ijk}}, \quad (2a)$$

$$MSHARE\_CIT_{ikc} = \frac{\sum_{j=1}^{J_{ikc}} AF_{ijkc}}{\sum_{i=1}^{I_{kc}}\sum_{j=1}^{J_{ikc}} AF_{ijkc}}, \quad (2b)$$

$$MSHARE\_PAR_{kcp} = \frac{\sum_{j=1}^{J_{kcp}} AF_{jkcp}}{\sum_{i=1}^{I_{kc}}\sum_{j=1}^{J_{ikc}} AF_{ijkc}}, \quad (2c)$$

where,

i = Index of audit firms;

j = Index of clients;

k = Index of industries;

I_k = Number of audit firms in industry k;

I_{kc} = Number of audit firms in industry k in city c;

J_{ik} = Number of clients served by audit firm i in industry k;

J_{ikc} = Number of clients served by audit firm i in industry k in city c;

J_{kcp} = Number of clients served by partner p in industry k in city c;

AF_{ijk} = Total audit fees for audit firm i from client j in industry k;

AF_{ijkc} = Total audit fees for audit firm i from client j in industry k in city c; and

AF_{jkcp} = Total audit fees for partner p from client j in industry k in city c.

If partner expertise is an important variable in explaining the audit fee premium, we expect the coefficient on partner market share (*MSHARE_PAR*) to be positive and significant. The positive relation between industry expertise at the city-level and audit fees documented in previous studies is based on the assumption of within-office knowledge sharing. The coefficient for *MSHARE_CIT* should be positive and significant and incremental to the *MSHARE_PAR* variable, for consistency with this assumption. Finally, we expect the coefficient for expertise at the national level (*MSHARE_NAT*) to be insignificant when city level expertise is controlled for, given Ferguson et al.'s (2003) finding that national industry leadership alone is not associated with a fee premium.[23] Note that our experimental variables differ from those in Zerni (2012) in that we consider the market share variables at all three levels. This "horse-race" analysis tests whether the industry expertise fee premium is specific to partner experts or is a firm- or office-level phenomenon, an insight not available from Zerni (2012).

While the use of continuous market share variables avoids arbitrary definition of an industry expert, their use assumes a log-linear relation between audit fees and auditors' market shares. This assumption may not be descriptive of the auditing industry. For example, using national and city level variables, previous studies have shown that the second-ranked auditor in an industry may not earn a fee premium relative to lower ranked auditors in that industry (Ferguson et al. 2003; Francis et al. 2005; Basioudis and Francis 2007).[24] This relation could also apply at the partner level.[25] To accommodate such a non-linear relationship between the fee premium and industry leadership, we also use the following indicator

[23] The Pearson (Spearman) correlation coefficient between the *MSHARE_CIT* and *MSHARE_PAR* variables is 0.65 (0.51), but none of the variance inflation factors (VIFs) in our regression analysis indicate that multicollinearity causes problems with the estimates (see Table 5 below).

[24] This suggests that the top-ranked auditors have a more credible reputation for industry expertise, relative to other large auditors in the industry.

[25] We calculate the top and second ranked industry leader by market share in each industry each year at the national, city, and partner-city levels. The means of the top (second) ranked leaders are about 45 (23) percent for national leaders, about 62 (18) percent for city leaders, and about 53 (17) percent for partner leaders. Medians are about 39 (24) percent for national leaders, about 57 (19) percent for city leaders, and about 46 (16) percent for partner leaders. If we use audit fees paid to all auditors the gaps in means and medians between first and second ranked is about 2 percentage points wider at each of the three auditor levels. These statistics are consistent with those reported in prior studies (e.g., Ferguson et al. 2003) and suggest that top-ranked auditors dominate the second-ranked at the three auditor levels.

variables to investigate how different levels of industry leadership affect the audit fee premium in our "top leader" model:

LEADER_NAT = Indicator variable equal to unity if the audit firm is the top ranked by market share of audit fees for that industry in Australia, and zero otherwise;

LEADER_CIT = Indicator variable equal to unity if the audit office is the top ranked by market share of audit fees for that industry in the city of the office, and zero otherwise; and

LEADER_PAR = Indicator variable equal to unity if the audit partner is the top ranked by market share of audit fees for that industry in the city of his office, and zero otherwise.

Although our analysis is based on Big N clients, our market share and leadership indicator variables are measured using all ASX-listed clients with data available over the 2003-2010 period (n = 13,540) to minimize the potential measurement error in these variables.

4.2 Control variables

We control for the following client-specific factors that should explain audit pricing by following Ferguson et al. (2003) and Francis et al. (2005):

LTA = Natural logarithm of total assets divided by 1,000;

LSUB = Natural logarithm of the number of subsidiaries, and when the number of subsidiaries equals zero LSUB equals the natural logarithm of 0.00001;

CATA = Current assets divided by total assets and it is capped at its 99th percentile value;

QUICK = Current assets less inventories divided by current liabilities and it is capped at its 99th percentile value;

DE = Long-term debt divided by total assets and it is capped at its 99th percentile value;

ROI = Earnings before interest and tax divided by total assets and it is winsorized at its 1st and 99th percentiles;

OPINION = Indicator variable equal to unity if the audit report is qualified or if a going concern opinion audit report is issued, and zero otherwise;

YE = Indicator variable equal to unity the client's year end is not June 30, and zero otherwise; and

LOSS = Indicator variable equal to unity if the client has reported a loss in the last three years, and zero otherwise.

BYSSEG = Natural logarithm of the number of business segments; and

GEOSEG = Natural logarithm of the number of geographic segments.

We expect positive coefficients on *LTA*, *LSUB*, *CATA*, *DE*, *LOSS*, and *OPINION* since audits of larger, more complex, and more risky clients require more effort and should be associated with higher fees as a consequence. *QUICK* and *ROI* are expected to have negative coefficients as they are negatively related to audit risks. Clients with off-peak fiscal year ends are expected to have lower fees, implying a negative coefficient on *YE*. Ferguson et al (2003) also control for *FOREIGN*, measured as the number of foreign subsidiaries divided by total number of subsidiaries. We exclude *FOREIGN* and instead include the two segment variables, *BYSSEG* and *GEOSEG*, because *FOREIGN* is redundant when these two variables are controlled for in our estimations. We expect both segment variables to be positively correlated with audit fees as audit effort and audit risk should increase with the number of business/geographic segments.

We also control for the following auditor-specific factors:

SIZEOFF = Natural logarithm of the sum of audit fees paid to the audit office by all clients of that office during a year;

SCALE_CIT = Percentile rank of the city-industry number of clients for each office;

SCALE_PAR = Percentile rank of the city-industry number of clients for each partner; and

FEMALE = Indicator variable if the incumbent partner is female and zero otherwise.

Choi et al. (2010) argue that audits provided by large offices are of higher quality and are associated with higher fees as a result. Thus we expect *SIZEOFF* to have a positive coefficient in the audit fee regressions. For a sample of U.S. clients, Fung et al. (2012) report that city-level scale economies are negatively related to audit fees.[26] We control for this discount effect of scale economies by *SCALE_CIT*. We also control for partner-level scale effects by *SCALE_PAR* because partner market share or leadership variables could be correlated with the size of his portfolio, which could be further correlated with audit fees.[27] Following Fung et al (2012), for each year, we first compute the number of clients audited by a

[26] A similar argument is made by Cahan et al. (2011).

[27] As discussed in section 5.1.1, we obtain consistent results to Fung et al. (2012) for their office-level industry scale variable (*SCALE_CIT*) only when both of the partner level variables (i.e., *MSHARE_PAR* or *LEAD_PAR* and *SCALE_PAR*) are omitted from our model.

partner (office) in each city-industry and then rank these numbers across all city-industry combinations. *SCALE_PAR* and *SCALE_CIT* are the percentile ranks at the partner and office levels, respectively.[28] Same as the measurement of the experimental variables, *SCALE_PAR* and *SCALE_CIT* are calculated based on all ASX-listed clients over the sample period. Negative coefficients for *SCALE_PAR* and *SCALE_CIT* are consistent with Fung et al.'s (2012) argument. Motivated by Ittonen and Vähämaa's (2012) finding that female audit engagement partners charge higher fees, we include an indicator for female incumbent audit partners (*FEMALE*) and expect its coefficient to be positive. Finally, following Francis et al. (2005), we include indicator variables for GICS Industry groups to control for the average differences in audit fees across industries and we also include yearly indicators to account for variations in audit fees over time.

4.3 Descriptive statistics and correlations of the variables

The descriptive statistics presented in Table 3 show that the mean for the partner's market share variable (*MSHARE_PAR*) is about 13 percent and the median is about 5 percent, indicating that it is right skewed. The same pattern holds for the market share variable at the city-level (*MSHARE_CIT*). These statistics suggest that the partner and city markets are dominated by a small number of industry leaders. This pattern is not observed at the national-level, as the mean of the *MSHARE_NAT* variable is quite close to its median. The mean of 16.2 for *LEAD_PAR* indicates that about 979 of the 6,042 client years are audited by partners who are industry leaders. The mean and median of *SCALE_CIT* are higher than those reported by Fung et al. (2012) because there are a large proportion of offices that audit one client in an industry-year. The ranking process weights these observations higher, which increases the mean and median value. Nevertheless, the correlation coefficients between *SCALE_CIT* and other variables in our sample are quite close to those in Fung et al. (2012) (discussed below). The means of other control variables are generally close to those in Ferguson et al. (2003, Table 2). The exception is *LSUB*, which has larger mean than in Ferguson et al. (2003), suggesting that Australian clients' organization structures have recently become more complex.

[28] Similar to Fung et al (2012), we use the PROC RANK procedure in SAS® to rank the clients. See Fung et al. (2012, footnote 15, p.1292) for further information about the calculation of *SCALE_CIT*.

Table 3 about here

Table 4 reports Pearson correlation coefficients for the variables. The correlations between the three market share variables and audit fees are all positive as expected, but the partner variable (*MSHARE_PAR*) is the strongest among the three. Similar relations are observed for the three market leader variables. The market share or the leader variables are strongly correlated with each other, especially for the market share variables. For example, the correlation coefficient between *MSHARE_CIT* and *MSHARE_PAR* is 0.652 and it is 0.442 between *LEAD_CIT* and *LEAD_PAR*. While these coefficients are well below the level of 0.80, which is often regarded as a critical level for indicating the presence of severe multicollinearity, we provide the variance inflation factor (VIF) statistics in our regression analysis to assess the influence of multicollinearity. As noted, the correlations between *SCALE_CIT* and our variables are quite similar to those reported in Fung et al. (2012). Of the 11 common correlations, nine of them have the same sign and the coefficient magnitudes and rankings are close. For example, the correlation coefficient between our coefficients (coefficient ranks) and theirs is about 0.84 (0.78). The major exception occurs for *CATA* where our correlation is -0.04 and Fung et al. (2012) report a coefficient of 0.13. The office-level scale measure (*SCALE_CIT*), is more strongly correlated with the partner leadership variables than is *SCALE_PAR*, and while both *SCALE_CIT* and *SCALE_PAR* are negatively correlated with audit fees, *SCALE_PAR* is the stronger of the two. These relations suggest that partner leadership could be an important control variable when examining office-level scale effects and that *SCALE_PAR* could have a stronger negative relation with audit fees than does *SCALE_CIT* in regressions. Although the correlation analysis suggests that partner level variables are more important in explaining audit fee premiums than variables measured at the firm- or office-level, the partner-level variables are correlated with other variables that affect audit fees. We next turn to multivariate regression analysis to provide more robust evidence on how industry leadership at different auditor levels influences audit pricing.

Table 4 about here

5 Empirical results

5.1 Main results

The results of tests using the market share variables, shown in the far left column of numbers in Table 5, indicate that there is only a partner expertise fee premium. Specifically, the *MSHARE_PAR* coefficient is significant and positive at the 1 percent level, while the *MSHARE_CIT* coefficient is negative and significant the 5 percent level and the *MSHARE_NAT* coefficient is insignificant. Untabulated regressions results show that if *MSHARE_CIT* and *MSHARE_PAR* are removed from the model, the *MSHARE_NAT* coefficient is positive and significant at the 1 percent level (coeff. = 0.229); and if only *MSHARE_PAR* is removed from the model, the *MSHARE_CIT* coefficient is positive and significant at the 1 percent level (coeff. = 0.285), and the *MSHARE_NAT* coefficient is positive and insignificant (coeff. = 0.039, $p = 0.496$). This latter result is consistent with Ferguson et al.'s (2003) finding that office-level expertise is more important than firm-level expertise in explaining fee premiums. Given the positive correlation between *MSHARE_PAR* and *MSHARE_CIT* shown in Table 4, it is evident that such a positive effect of *MSHARE_CIT* on audit fees is due to the omission of *MSHARE_PAR*. As the *MSHARE_CIT* variable does not have a positive effect, incremental to the *MSHARE_PAR* variable, this evidence does not support the view that expertise can be transferred between engagement partners within the office. With regard to economic importance, a one standard deviation increase in *MSHARE_PAR* leads to an economically-important increase in audit fees of about 26.4 percent,[29] and a one standard deviation increase in *MSHARE_CIT* leads to a decrease in audit fees of about 6.9 percent.

Results using the top national, city, and partner leaders are shown in the middle column of numbers in Table 5. Consistent with the results using market shares, the *LEAD_NAT* coefficient is not significant and *LEAD_PAR* coefficient is positive and significant. The *LEAD_PAR* coefficient of 0.343 equates to an economically-important fee premium of about 41 percent.[30] The office leadership variable (*LEAD_CIT*) is not significant, which is inconsistent with the market share results. Consequently, we suspect that

[29] This is estimated by $e^{(Z*\sigma)} - 1$, where $e^{(\ )}$ is the exponential function, Z is the regression coefficient on *MSHARE_PAR*, and σ is the standard deviation of *MSHARE_PAR*. This procedure is described in Simon and Francis (1988).

[30] Since these indicator variables have values of zero or one, the fee premium can estimated by $e^{z} - 1$, where z is the coefficient estimate for the indicator variable.

important information correlated with *LEAD_CIT* is subsumed within the intercept in this model, and estimate a variety of different models including second and third leaders at the national and city levels, none of which changed the inference for *LEAD_CIT*.[31] However, when we progressively added second, third, and lower level partner leaders, a different picture emerges. We tried up to twenty partner leaders but settled on the top twelve because all of those twelve partner leader coefficients are significant, and their signs are consistent with expectations.[32] These results are shown in the far right column of numbers in Table 5. In this model, the top partner leader earns a premium of about 131.9 percent and the partner premiums decline almost monotonically to about 18.6 percent for the twelfth-ranked partner. This pattern clearly illustrates that, as a partner increases his ranking in the industry, he gradually builds his reputation as an industry expert and charges higher audit fees. It also suggests that the continuous market share variable is generally well specified. After the top twelve partner indicators are included in the regression, the city leader coefficient becomes significantly negative and indicates a fee discount of about 6.9 percent for the average client of a city leader. A possible explanation for the negative *MSHARE_CIT* and *LEAD_CIT* coefficients is that these variables capture the effects of omitted variables. We return to this issue in section 5.2.

The coefficients for the client-specific control variables are all significant with signs consistent with expectations, except for *LOSS* and *YE*. The coefficient for *SIZEOFF* is significantly positive, suggesting Choi et al.'s (2010) U.S.-based finding also holds in Australia. By contrast, the coefficient for *SCALE_CIT* is always positive and it is significant in two models, which are inconsistent with Fung et al. (2012). We obtain a significant negative coefficient for *SCALE_CIT* (at the 1 percent level), consistent with Fung et al. (2012), if the partner leader variables and *SCALE_PAR* are removed from the models. This suggests that these two partner-level variables are important omitted variables from their model.[33] The subsumption of

[31] Untabulated analysis suggests that the coefficients for these lower-ranked national and city leader variables are insignificant.

[32] If the top 13 partners are used, the 13th partner leader's coefficient is positive and insignificant ($p = 0.165$) and inferences are unchanged for the national and city leader coefficients. If the top 20 partners are used, all partner coefficients are positive and all partner coefficients are significant except for the 18th ranked partner's coefficient ($p = 0.198$), and inferences are unchanged for the national and city leader coefficients.

[33] More specifically, if only the partner leader variables are removed, coefficient for *SCALE_CIT* is negative and significant (coeff. = -0.087, p=0.073) in the "top leader" model but insignificant in the "market share" model (coeff. = -0.101, p =

much of the information in *SCALE_CIT* by *SCALE_PAR* also suggests that the scale discount is mainly a partner-level phenomenon, consistent with the results for the expertise fee premium. The positive and significant result for *SCALE_CIT*, observed in two models, suggests a fee premium associated with office-level scale economies, which is incremental to that driven by *SIZEOFF*. The second last row of the table reports the highest VIF of the experimental variables. These VIFs range from about 1.629 and 3.418, suggesting that multicollinearity is not likely causing problems with the estimates.

Table 5 about here

5.1.1 Sub-sample regressions

We estimate eight cross-sectional regressions for each sample year to observe if a small number of years drive the results. Untabulated results show that the coefficients for the partner market share variables in the "market share" model are positive and significant at the 1 percent level for each of the 8 years, and all of the coefficients for the national market share variables are insignificant except for years 2003, 2009 and 2010 where the coefficient is significantly positive (at the 5 percent level in 2003 and 10 percent levels in 2009 and 2010). For the 2005, 2008, 2009, and 2010 years, the coefficients for the city market share variables are negative and significant at least at the 5 percent level, and they are insignificant for the other years. With regard to the "top leader" model, the *LEAD_PAR* coefficient is positive and significant at the 1 percent level for each of the 8 years, and all of the coefficients for the national market share variables are insignificant. The coefficients for *LEAD_CIT* are all insignificant except for the 2009 year where the coefficient is negative and significant at the 10 percent level. These by-year regression results are not consistent with a within-office knowledge sharing argument of auditor industry expertise.

To observe whether a small number of offices drive the results, we drop all the observations for an office, one office at a time, and estimate the "market share" and "top leader" models on the sub-samples. There are twenty regressions estimated for each model (4 firms multiplied by 5 cities). Untabulated results from estimating the "market share" model show that the *MSHARE_PAR* coefficient is significant and

0.199), while *SCALE_PAR* continues to be significantly negative at the 1 percent level in both models. If *SCALE_PAR* is further removed, *SCALE_CIT* coefficient becomes negative and significant at the 1 percent level in both models.

positive at the 1 percent level in all 20 regressions, that the *MSHARE_CIT* coefficient is significantly negative in all 20 regressions. The *MSHARE_NAT* coefficient is insignificant in all regressions except the sub-sample where we remove DT's Sydney office. In this sub-sample, the *MSHARE_NAT* coefficient is 0.204 ($p = 0.071$) and, by contrast, the *MSHARE_PAR* coefficient is 1.153 ($p < 0.001$). In the "top leader" model, all 20 coefficients for *LEAD_PAR* are positive and significant at the 1 percent level and all *LEAD_CIT* coefficients are insignificant. Three of the *LEAD_NAT* coefficients are significant and positive and the others are insignificant. The significant coefficients for *LEAD_NAT* occur when we remove the DT Sydney, DT Melbourne, or PW Adelaide offices and the coefficients (*p*-values) for *LEAD_NAT* are 0.032, 0.034, and 0.033 (0.097, 0.087, and 0.096), respectively. By contrast, in all of these 20 regressions, the smallest coefficient for *LEAD_PAR* is 0.327 ($p < 0.001$). For this evidence, even if one believes in a significant relation between *LEAD_NAT* and audit fees, the partner effect is economically much more important than is the national leader effect. Overall, our finding that the partner-level industry expertise drives the audit fee premium is quite stable over time and is not driven by a small number of offices.

5.1.2 Tests using methodology of prior studies

An alternative approach to examining the importance of partner level industry expertise is to subject the joint city and national research framework used in prior studies (Ferguson et al. 2003; Francis et al. 2005; Basioudis and Francis 2007) to exclusion and inclusion of partner leader variables. These studies use three indicator variables, namely city only leader, national only leader, and joint city and national leader variables. Consistent with Francis et al. (2005) and Basioudis and Francis (2007), we define these indicator variables as:[34]

ONLY CITY LEADER = Unity of the audit office which audits the client is the city leader in that industry and the office's audit firm is not the industry leader nationally, and zero otherwise;

ONLY NAT LEADER = Unity if the audit office which audits the client is from the industry leader audit firm nationally and the office is not the industry leader in that city, and zero otherwise; and

[34] Francis et al. (2005) and Basioudis and Francis (2007) use the top-ranked national leader while Ferguson et al. (2003) use the top two ranked national leaders in their models. We do not use Ferguson et al.'s (2003) measures here because we replicate and extend their model below.

JOINT CITY-NAT LEADER = Unity if the audit office which audits the client is from the industry leader audit firm nationally and the office is the city leader in that industry, and zero otherwise.

If auditor expertise and its consequent premium is primarily a city-level phenomenon, then there should be little change in the *ONLY CITY LEADER* and *JOINT CITY-NAT LEADER* coefficient estimates when the observations audited by partner leaders are removed from the sample or when partner leader variables are added to the model.

The left column of numbers in Table 6 presents results from replicating the above methodology using the full sample. Consistent with prior studies, the coefficients for the joint leader and the city leader are positive and significant at the 1 percent level and the coefficient for the national leader is insignificant. The fee premium for the joint city and national leader is about 14.3 percent and it is about 8.3 percent for the city only leader. This joint city-national premium is lower than the percentages of 19 and 24 previously reported for office leaders in the U.S. and Australia, respectively (Francis et al. 2005; Ferguson et al. 2003), but the city only premium is quite close to the percentage of about 8 reported by Francis et al. (2005).[35] We obtain almost the same premium of about 14 percent for joint city-national leader if we use a model specification that is very close to the one used in Francis et al (2005). However, when we estimate their model using the 2003 and 2004 data, this premium estimate increases to 19 percent and the city only premium estimate is about 8 percent, which are quite consistent with the results in Francis et al (2005). Therefore, it seems that the joint city and national premium is lower in recent years using this model. Nevertheless, when we exclude the 978 client-years where the partner is the top-ranked industry leader, all auditor leader indicator variables are insignificant, as reported in the middle column of the table. This result is consistent with office-leader premiums being concentrated in the engagements administered by the partners leaders. The two columns on the right of the table include the partner leader indicator variable and the partner market share, respectively, and both of these coefficients are positive and significant at the 1 percent level. Most important, none of the three coefficients for the city and national leader research framework are significantly positive, and the coefficient for the only city leader variable is negative and

[35] The estimates from Francis et al. (2005) and Ferguson et al. (2003) are the premiums for the joint national-city industry leadership, which are higher than premiums for city leadership alone in both studies. In the U.K., the premium for city-specific industry leadership averages 19 percent, which is higher than the average premium of 12 percent for joint national-city industry leadership (Basioudis and Francis 2007).

significant (at the 5 percent level) when partner market share is added to the model. The coefficients for the control variables are generally consistent with expectations, except for *SCALE_CIT*, which, as noted, is correlated with *SCALE_PAR* and the partner leader variables.

We also obtain the same inferences for the each of the three regressions shown in the three right hand columns of Table 6, by estimating yearly regressions and then by estimating twenty separate regressions on sub-samples where we exclude one audit office at a time. In both of these sets of tests, the *ONLY NAT LEADER*, *ONLY CITY LEADER*, and *JOINT NAT_CITY LEADER* coefficients are never positive and significant.

Table 6 about here

The Table 6 results also suggest that multicollinearity is not the cause of insignificance of the city or national expertise coefficients. As noted, our partner expertise variables are correlated with city or national expertise variables, which may result in multicollinearity problems with the coefficient estimates.[36] In the sample where clients of partner leaders are excluded, the potential multicollinearity problem from adding the partner leader variable is redundant. We should observe significant coefficients on city and national expertise variables in such a sample, if they are really associated with fee premiums. This is obviously not the case. The insignificance indicates the absence of premiums for city or national leadership, rather than the result of multicollinearity. The results in this section also suggest that the partner leader variable is an important omitted variable from prior studies, because the partner expertise variables subsume the positive effects of city or national leadership on audit fees.

5.1.3 Replication of Ferguson et al. (2003)

To examine whether the results are robust to a different time period and industry classification, we replicate and extend the model in Ferguson et al. (2003), using data from fiscal year 1998 as they do. As noted, from July 1 2002 the ASX changed the industry classifications, so we use the ASX classifications in force in 1998. For consistency with Ferguson et al (2003), we also use total audit fees rather than audit fees paid to the parent entity auditor in calculating market shares and industry leaders and, correspondingly, we

[36] Nevertheless, as suggested by the VIF statistics reported in the tables, there is little statistical evidence of severe multicollinearity problems in our estimations.

use natural logarithm of total audit fees (*LAF_ALL*) as the dependent variable in our regressions. We first check the accuracy of our leadership measurements by calculating city and national level industry leaders' market shares and compare our calculations to those in Ferguson et al (2003).[37] Our sample of 1,079 clients in the Adelaide, Brisbane, Melbourne, Perth, and Sydney city offices, totals 33 more (24 more Big 5 clients) than Ferguson et al. (2003) because we use all listed clients.[38] Consequently, our market share rankings and variables are unlikely to be identical to Ferguson et al. (2003). We obtain identical ranks to them for the first and second national leaders in all of the 24 industries with the following three exceptions. For the Gold mining industry we obtain the reverse of Ferguson et al.'s (2003) first and second leaders. However, the market share difference between our first and second ranked leader is about 0.19 percentage points. As we do not round our percentages when determining ranks, this could explain the difference in ranks. For the Healthcare and Biotechnology industry, PWC ranks second in our sample with about 20 percent market share and Ferguson et al. (2003) report that DT ranks second with about 17 percent market share. We also obtain a 17 percent market share for DT for the Healthcare and Biotechnology industry. Ferguson et al. (2003) report the name and market share of the leading audit firm for each of their 103 city-industry combinations. We have 102 city-industry combinations and there are only seven cases where our city leaders are different from theirs.[39] These differences are expected: Ferguson et al. (2003) have fewer clients, meaning that there could be a change in rank of market share as one more client is added to their sample in those city-industries.[40] For 84 of the 102 city-industries, the absolute differences in the market shares of leading auditors between our data and those in Ferguson et al. (2003) are equal to or less than 5 percent. Untabulated statistics show that the means and standard deviations of our regression variables are very close to those reported in Table 2 of Ferguson et al. (2003).

---

[37] Ferguson et al. (2003, p.435-436) report city- and national-level industry leaders in panel B of Table 1.

[38] Ferguson et al. (2003) use "nearly all Australian publicly listed companies" (Ferguson et al. 2003, p.434). The biggest difference between our data and those in Ferguson et al. (2003) occurs for the Sydney city office, where we have a total of 419 clients and Ferguson et al. (2003) report a total of 397 clients.

[39] While we have more observations we also have one fewer city industries than Ferguson et al (2003). We do not know the reason for the difference.

[40] The Auditor General signed the audit report for Telstra Corporation in 1998 because the Australian National Audit Office was Telstra's external auditor. PriceWaterhouseCoopers was subcontracted some of the audit work in the 1998 year. We assign Telstra's 1998 audit to PriceWaterhouseCoopers following Ferguson et al. (2003). See also footnote 14.

Table 7 presents Ferguson et al.'s (2003) results in the far left column of numbers, and our results using Ferguson et al.'s (2003) model in the second from the left column of numbers.[41] The replication results are quite close. Note that in this model the top two national leaders are used to identify national experts for consistency with Ferguson et al (2003). In particular, the coefficient on the key variable of Ferguson et al. (2003), *JOINT CITY-NAT2 LEADER*, is 0.213, while our estimate is 0.216, and both are significant at the 1 percent level. A notable exception is that we obtain a significant negative coefficient for the *ONLY CITY LEADER* variable (p = 0.027) and Ferguson et al. (2003) report an insignificant negative coefficient for this variable (p = 0.338). The magnitudes of the coefficients and significance levels for the other variables are quite close to those reported in Ferguson et al. (2003). We next exclude the observations where the partner is the industry leader from our sample, an analysis similar to the one in section 5.1.2. Results presented in the middle column of numbers, show that the coefficient for the *JOINT CITY-NAT2 LEADER* variable becomes insignificant (coeff. = 0.085, p = 0.258), and the *ONLY CITY LEADER* and *ONLY NAT2 LEADER* coefficient estimates remain significantly negative and insignificant, respectively. Finally, we add the partner leader indicator variable or the partner market share variable to the model, with the results reported in the two columns on the far right of the table. Including the partner variables reduces the coefficient magnitude of the *JOINT CITY-NAT2 LEADER* variable by about half and the coefficients become insignificant. Both partner leader variables are positive and significant at the 1 percent level. Thus, our conclusion that partner leader industry expertise is the driver of the audit fee premium, and that office and national level expertise are not important drivers, is robust to a different time period when the industry classifications were different.

Table 7 about here

This replication exercise also helps us estimate how much the audit fee premium for expertise has been underestimated in the prior literature. Using the coefficient estimate (0.216) based on the replication of Ferguson et al.'s (2003) model, the fee premium paid to the average joint city-national industry leader is about 24.1 percent. Ferguson et al. (2003) report a premium of 24 percent. Based on almost the same sample, the coefficient on our partner leader variable is 0.365, implying a fee premium of about 44.1

[41] We reproduce only their combined model, namely the model using the joint city and national research framework (their Model 3). *P*-values in Ferguson et al.'s (2003) table are from one-tailed tests.

percent associated with partner industry leaders. This indicates that by omitting partner-level analysis the fee premium for expertise is underestimated by about 20 percentage points. The larger estimate of the fee premium documented in our sample from the 2003 to 2010 years, cannot therefore, be attributed to the differences in sample composition, industry classifications, or time period alone. Instead, the fee premium estimates from prior studies have been understated due to the omission of partner industry leaders, the true driver for the audit fee premium for industry expertise.

In sum, the above results suggest that partner industry expertise is an important omitted variable from most prior studies of the audit expertise fee premium. The documented fee premiums associated with joint national and city industry leaders are essentially clustered in audits performed by partner experts. These results are not consistent with within-office knowledge sharing, but with audit pricing being partner-specific. In the next section we use different models to further assess the robustness of this conclusion.

5.2 Additional tests

Estimates from OLS regressions could be biased due to the omission of unobservable client characteristics such as the extent of the client's preference for partner expertise that are correlated with audit fees and the experimental variables. A valid instrumental variable (IV) is required to address this potential endogeneity problem using two-stage least squares (2SLS). To the best of our knowledge, partner age is the only IV which can be used with Australian data.[42] However, it turns out that this variable is a weak instrument for our data. For example, if partner age (in years) at the client's year end date is used as an IV with the "market share" model, the coefficient for partner age is 0.0004 (p = 0.024) in the first-stage regression. The F-statistic from comparing the model with and without the partner age IV is 5.980, which is below the level of 10 recommended for a valid IV (Staiger and Stock 1997). Similar results are obtained if we measure partner age at the date of the partner's registration as an auditor.[43] Larcker and Rusticus

[42] The intuition behind partner age is that, relative to younger partners, older partners are more senior and more likely to be industry experts due to the human capital accumulated over their careers. Moreover, we have no good reason to believe that partner age would affect audit fees through channels other than their expertise.

[43] The intuition here is that a partner who became an auditor earlier in his life is more likely to have progressed to be an expert. Consistent with this intuition, the coefficient for partner age in the first stage regression is 0.0003 (p = 0.075).

(2010) suggest that OLS estimates are preferred to the use of 2SLS in the case of weak instruments.[44] We therefore estimate the OLS-based client fixed effects regressions to address the possible endogeneity problem. Assuming that any client-related omitted variables are time invariant and captured by the client-specific fixed effect coefficients, this approach corrects for bias induced by endogeneity.

A partner's generic ability, which cannot be directly observed and measured, could also be an important correlated-and-omitted-variable. In particular, generic ability could be positively correlated with both of our experimental variables, market share or leader status, and the dependent variable, audit fees. Therefore, we also estimate a partner fixed-effects model. We believe controlling for partner fixed-effects to be particularly informative in our setting. To the extent that the partner expertise experimental variables capture a partner's generic ability rather than his expertise within an industry, these experimental variables should be insignificant in the partner fixed-effect regressions. Hence, the additional insight from including partner fixed effects is that fee premiums earned by partner experts do not represent general differences in audit fees due to their superior generic ability; rather such premiums are specific to the industries in which partners are experts.

Prior to estimating these fixed effects regressions, it is important to examine the within-client and within-partner variation of our experimental variables because low within-group variation results in higher standard errors and less precise estimates (Beck and Katz 2001). In Table 8 we report the intraclass correlation coefficients (ICCs) for the experimental variables. Note that higher ICCs indicate lower within-group variation, *ceteris paribus*. The two columns of numbers on the left of Table 8 show that the partner expertise variables generally have the lowest variation within-client or within-partner. The exception occurs for the within-partner correlation of *PAR_LEAD*, where it ranks second. As there is no "ideal" measure of intraclass correlation, we conduct another test by estimating fee models with client and partner fixed effects and all control variables, but with only one experimental variable at a time. The intuition is that low within-client or within-partner variation will render the coefficients insignificant in the

---

However, the F-statistic comparing the two models is 3.985. These 2SLS regressions were estimated on a sample size totalling 5,896 client years as we could not obtain partner age for 151 observations in our sample.

[44] Lennox et al. (2012) also demonstrate that the two-stage-type procedure to control for selection bias could yield fragile results, which are sensitive to minor changes in model specification.

absence of the other auditor-level variables. The last three columns of Table 8 show the results. The coefficients for all three auditor level variables are positive and significant. Taken together, these results suggest that low within-group variation for the national and city leader variables is unlikely to be a reason for observing insignificant coefficients of these variables in the fixed-effect regressions.

Table 8 about here

Table 9 shows results from client, and client and partner fixed-effects regressions. We performed an "iterative" procedure where we first estimate a client fixed effects regression and test the joint significance of these fixed effects. Results from the client fixed-effect regressions are shown in the columns labelled "C". Then we estimate a client and partner fixed-effect regression, and tested its significance over the client fixed-effect regression. Results from the client and partner fixed effects regressions are shown in the columns labelled "C, P". The F-statistics shown at the bottom of Table 9 are all significant at the 1 percent level except for the "top leader" model with only the top industry leaders (p = 0.210). The client and partner fixed effects do capture variations in audit fees across the clients and the partners in our sample, except for that model.

With regard to the "market share" model results, shown in the two far left columns with numbers, *MSHARE_PAR* coefficient is positive and significant, which is consistent with the OLS results shown in Table 5. However, coefficient on *MSHARE_NAT*, which is insignificant using OLS, is also significantly positive, while the significantly negative coefficient on *MSHARE_CIT* in OLS becomes insignificant in the fixed effects models. Time-constant client attributes, correlated with *MSHARE_NAT* and *MSHARE_CIT*, seem to be important omitted variables from the OLS regressions. This is supported by a large increase in adjusted R^2 to about 92.38% from the OLS to the client fixed effects regression. The "market share" model with client and partner fixed effects is better specified than the client fixed effects model with an increase in adjusted R-square of about 0.75 percentage points. In this model, only *MSHARE_PAR* is significant. This result is not consistent with within-office knowledge sharing, but with auditor expertise being partner driven. In the two "top leader" models reported in the middle two columns with numbers, the *LEAD_NAT* coefficient is insignificant and the *LEAD_PAR* coefficient is positive and significant, consistent with the OLS results. But the office-level variable (*LEAD_CIT*) now becomes positive and significant, which is inconsistent with the OLS results. Given the large increase in the adjusted R^2 and the highly significant

F-statistics in the client fixed effects model, omitted variable bias is the likely reason for the insignificant coefficient for *LEAD_CIT* shown in Table 5. An example of such a bias could be that higher quality boards have a stronger preference for expert auditors, a factor not considered in the OLS but is captured by the client fixed effects if such an attribute is fixed over time. This result supports a within-office knowledge sharing explanation and an individual partner pricing explanation for the fee premium. Nevertheless, in terms of relative economic importance, the effect of office leader on fee premiums is much smaller than that of partner leader (3.3 percent *versus* 19.8 percent). As with the OLS model, we seek to test the robustness of this result by progressively adding partner leaders. The two far right columns show that the *LEAD_CIT* and *LEAD_NAT* variables are, at best, marginally significant in the presence of indicators for the top 12 partner leaders. These results are consistent with OLS for the *LEAD_NAT* and *LEAD_PAR* variables. In terms of economic importance, the *LEAD_NAT* and *LEAD_CIT* coefficients are unimportant vis-à-vis the partner leader variables. For example, in the model with client and partner fixed effects, even the 12th-ranked partner's coefficient is about 3.5 times that of the national and the city leaders' coefficients. We conclude that there is no reliable evidence of within-office knowledge sharing and that partner expertise is the cause of the auditor expertise fee premium.[45] As with studies of this type, we acknowledge that the potential problem of omitted variables could still change the inferences from these tests. However, the adjusted R^2s shown at the bottom of Table 9 are above 92 percent, suggesting a relatively small influence of such variables.

The control variables coefficient signs and significance are generally consistent with the OLS results, although apart from *LOSS* and to a lesser extent *YE*, their magnitudes are lower. Consistent with the OLS results, these results also show that there is no evidence of scale economies at the office level once partner level variables are controlled for. Rather, scale economies (or alternatively lower audit effort) exist only at the partner level. Some of the VIFs are high and the "market share" model with client and partner fixed effects has a VIF above 10. Despite this, we do not believe that multicollinearity is causing problems with

[45] The magnitudes of the regression coefficients on partner market share or leadership variables in Table 9 are generally smaller than those in Table 5. This is because the coefficients in client (partner) fixed-effect regressions represent the within-client (partner) variations after the cross-client (partner) variations in audit fees have been absorbed by the client (partner) fixed-effect coefficients. In this sense, it is not appropriate to infer the overall magnitude of audit fee premiums for auditor expertise from the estimates of these regressions.

estimates because the coefficients for almost all of the independent variables are consistent with expectations, and they are generally consistent with OLS models where VIFs are low.

Table 9 about here

6 Conclusion and discussion

A widely-held belief in the auditing literature is that auditor specialization is an office-level phenomenon. Since audit partners do the audit work and obtain the industry expertise, it is possible that expertise at the partner-level subsumes some of the office-level effects on audit pricing. No study has tested this belief by subjecting the models to the effects of audit partner expertise. We address this gap in the literature by using data from Australia, where the name of the audit partner is disclosed and the audit market is sufficiently large and diverse. We employ two main empirical tests for audit partner industry expertise and control for a variety of explanatory variables, including client and partner fixed effects, in our models.

Based on a large dataset of Big 4 audit clients from 2003 to 2010, we find that the market prices audit partner industry expertise. The premiums for partner expertise range from about 41 percent to about 132 percent, depending on the model specifications, and are much higher than the premium estimates based on office-level data in previous studies. We also find that city- and national-level industry expertise is generally unimportant for explaining audit fees when partner expertise is controlled for. These results are stable over time and robust to different model specifications, and can be replicated on the sample of an important study in this line of literature, namely Ferguson et al. (2003), where the sample period and the industry classifications differ from those of the current study. Collectively, our findings support the argument that partner industry expertise is the driver of the audit fee premium. By casting doubt on the transferability of expertise across partners within the local office, the paper sheds new light on the nature of auditor industry expertise and improves our understanding of how Big 4 accounting firms operate in practice.

Our findings have implications for researchers, practitioners and regulators. Our message to researchers is that industry leadership measured at the partner level better captures the concept of the audit

fee premium compared to leadership measured at the firm- or office-level. Therefore, tests based on partner-level industry leadership should be more powerful in detecting the effects of auditor industry expertise. Moreover, several recent papers have documented that auditor industry specialization has a positive effect on clients' financial reporting quality (Chin and Chi 2009; Reichelt and Wang 2010; Ittonen et al. 2011) and influences clients' tax avoidance (McGuire et al. 2012). It would be worthwhile for future research to explore the relationship between fee premium for industry expertise, partners' leadership status, and actual or perceived audit quality in Australia, where data for audit fees and identities of signing partners are both available. We believe that audit researchers should treat the estimates from office-level variables cautiously when relevant partner-level variables are not controlled for.

For practitioners, our evidence suggests that fee premium for partner leadership is economically important. Therefore, it pays for an individual auditor to invest in industry specialization and build his reputation as an industry expert. Moreover, we do not find strong evidence supporting the effects of industry specialization on audit fees at the firm- or office-level. Given the fee premium associated with individual partners' expertise, developing more effective mechanisms to facilitate knowledge transfer between partners and create a broader reputation for industry expertise should be a profitable strategy for accounting firms.

Finally, in several countries, there is an on-going policy debate on whether the engagement partner's signature on the auditor's report should be mandated. Our findings suggest that audit market does price engagement partners' industry expertise. This pricing behavior implies that audits performed by expert partners are perceived to be more credible and thus more effectively in reducing agency costs, and correspondingly, clients are willing to pay higher audit fees for partner-specific expertise. Clearly, such a mechanism hinges on the availability of information regarding the identities of engagement partners as well as their market leadership. Before considering other costs involved, a direct benefit from public disclosure of engagement auditor signature is to enable users of financial reports to infer industry expertise of engagement partners. Such a disclosure requirement can also encourage engagement auditors to develop their industry expertise.

References

Ali, A. and L.-S. Hwang. 2000. Country-specific factors related to financial reporting and the value relevance of accounting data. *Journal of Accounting Research* 38 (1): 1-21.

Basioudis, I.G., and J.R. Francis. 2007. Big 4 audit fee premiums for national and office-level industry leadership in the United Kingdom. *Auditing: A Journal of Practice & Theory* 26 (2): 143-166.

Beck, N. and Katz. 2001. Throwing out the baby with the bath water: A comment on Green, Kim and Yoon. *International Organization* 55 (2): 487-495.

Bedard, J.C. 2012. Discussion of: Audit partner specialization and audit fees: Some evidence from Sweden. *Contemporary Accounting Research* 29 (1): 341-348.

Bedard, J.C., and K.M. Johnstone. 2004. Earnings manipulation risk, corporate governance risk, and auditors' planning and pricing decisions. *The Accounting Review* 79 (2): 277-304.

Bhattacharya, U., H. Daouk, and M. Welker. 2003. The world price of earnings opacity. *The Accounting Review* 78 (3): 641–678.

Bonner, S. and B. Lewis. 1990. Determinants of auditor expertise. *Journal of Accounting Research* 28 (Supplement): 1-20.

Bonner, S. and P. Walker. 1994. The effects of instruction and experience on the acquisition of auditor knowledge. *The Accounting Review* 69 (1): 157-178.

Cahan, S.F., D.C. Jeter, and V. Naiker. 2011. Are all industry specialist auditors the same? *Auditing: A Journal of Practice & Theory* 30 (4): 191-222.

Carey, P., and R. Simnett. 2006. Audit partner tenure and audit quality. *The Accounting Review* 81 (3): 653-676.

Casterella, J.R., J.R. Francis, B.L. Lewis, and P.L. Walker. 2004. Auditor industry specialization, client bargaining power, and audit pricing. *Auditing: A Journal of Practice & Theory* 23 (1): 123-140.

Chan, K.H., and D. Wu. 2011. Aggregate quasi rents and auditor independence: Evidence from audit firm mergers in China. *Contemporary Accounting Research* 28 (1): 173-213.

Chen, S., S. Sun, and D. Wu. 2010. Client importance, institutional improvements, and audit quality in China: An office and individual auditor level analysis. *The Accounting Review* 85 (1): 127-158.

Chi, W., E.B. Douthett, and L.L. Lisic. 2012. Client importance and audit partner independence. *Journal of Accounting and Public Policy* 31 (3): 320-336.

Chin, C-L., and H.Y. Chi. 2009. Reducing restatements with increased industry expertise. *Contemporary Accounting Research* 26 (3): 729-65.

Choi, J.-H., C. Kim, J.-B. Kim, and Y. Zang. 2010. Audit office size, audit quality, and audit pricing. *Auditing: A Journal of Practice & Theory* 29 (1): 73-97.

Chow, C., J. Ho, and S. Vera-Muñoz. 2008. Exploring the extent and determinants of knowledge sharing in audit engagements. *Asia-Pacific Journal of Accounting and Economics* 15 (2) 141-160.

Chung, H.S. and S. Kallapur. 2003. Client importance, nonaudit services, and abnormal accruals. *The Accounting Review* 78 (4): 931-955.

Craswell, A.T., D.J. Stokes, and J. Laughton. 2002. Auditor independence and fee dependence. *Journal of Accounting and Economics* 33 (2): 253-275.

Craswell, A.T., J.R. Francis, and S. Taylor. 1995. Auditor brand name reputations and industry specializations. *Journal of Accounting and Economics* 20 (3): 297-322.

DeFond, M. and J.R. Francis. 2005. Audit research after Sarbanes-Oxley. *Auditing: A Journal of Practice & Theory* 24 (Supplement): 5-30.

DeFond, M., J.R. Francis, and T.J. Wong. 2000. Auditor industry specialization and market segmentation: Evidence from Hong Kong. *Auditing: A Journal of Practice & Theory* 19 (1): 49-66.

Fama, E.F. and M.C. Jensen. 1983a. Separation of ownership and control. *Journal of Law and Economics* 26 (2): 301-325.

Fama, E.F. and M.C. Jensen. 1983b. Agency problems and residual claims. *Journal of Law and Economics* 26 (2): 327-349.

Ferguson, A., J.R. Francis, and D.J. Stokes. 2003. The effects of firm-wide and office-level industry expertise on audit pricing. *The Accounting Review* 78 (2): 429-448.

Francis, J.R. 1984. The effect of audit firm size on audit prices: A study of the Australian market. *Journal of Accounting and Economics* 6 (2): 133-151.

Francis, J.R. and D. Simon. 1987. A test of audit pricing in the small-client segment of the U.S. audit market. *The Accounting Review* 62 (1): 145-157.

Francis, J.R. and D.J. Stokes. 1986. Audit prices, product differentiation, and scale economies: further evidence from the Australian audit market. *Journal of Accounting Research* 24 (2): 383–393.

Francis, J.R. and M. Yu. 2009. The effect of Big Four office size on audit quality. *The Accounting Review* 84 (5): 1521-1552.

Francis, J.R., D.J. Stokes, and D. Anderson. 1999. City markets as a unit of analysis in audit research and the re-examination of Big 6 market shares. *Abacus* 35 (2): 185-206.

Francis, J.R., I.K. Khurana, and R. Pereira. 2003. The role of accounting and auditing in corporate governance and the development of financial markets around the world. *Asia-Pacific Journal of Accounting and Economics* 10 (1): 1-30.

Francis, J.R., K. Reicheldt, and D. Wang. 2005. The pricing of national and city-specific reputations for industry expertise in the U.S. audit market. *The Accounting Review* 80 (1): 113-136.

Frederick, D. and R. Libby. 1986. Expertise and auditors' judgments on conjunctive events. *Journal of Accounting Research* 24 (2): 270-290.

Fung, Y.K., F.A. Gul, and J. Krishnan. 2012. City-level auditor industry specialization, economies of scale, and audit pricing. *The Accounting Review* 87 (4): 1281-1307.

Gaver, J. and J. Paterson. 2007. The influence of large clients on office-level auditor oversight: Evidence from the property-casualty insurance industry. *Journal of Accounting and Economics* 43 (2-3): 299-320.

Gow, I.D., G. Ormazabal, and D.J. Taylor. 2010. Correcting for cross-sectional and time-series dependence in accounting research. *The Accounting Review* 85 (2): 483-512.

Gul, F.A., D. Wu, and Z. Yang. 2011. Do individual auditors affect audit quality? Evidence from archival data. Working paper. Available at SSRN: http://ssrn.com/abstract=1888424.

Hayek, F.A. 1945. The use of knowledge in society. *American Economic Review* 35 (4): 519-530.

Hogan, C. and D. Jeter. 1999. Industry specialization by auditors. Auditing: A Journal of Practice & Theory 18 (1): 1-17.

Hogan, C. and R. Martin. 2009. Risk-shifts in the market for audits: An examination of changes in risk for "second tier" audit firms. *Auditing: A Journal of Practice & Theory* 28 (2): 93-118.

Hung, M.Y. 2001. Accounting standards and value relevance of financial statements: An international analysis. *Journal of Accounting and Economics* 30 (3): 401-420.

Ittonen, K., K. Johnstone, and E.R. Myllymäki. 2011. Audit partner public-client specialization and client

abnormal accruals. Working paper, University of Vaasa and University of Wisconsin.

Ittonen, K., K. and Vähämaa, E. 2012. Auditor's gender and audit fees. *International Journal of Auditing*, 16 (1): 1-18.

Jensen, M.C. and W.H. Meckling, 1976. Theory of the firm: Managerial behavior, agency costs and ownership structure. *Journal of Financial Economics* 3 (4): 305-360.

Jensen, M.C. and W.H. Meckling, 1992. Specific and general knowledge and organizational structure. In *Foundations of Organizational Strategy*, edited by M.C. Jensen. Harvard University Press, 1998. Cambridge, MA, U.S.

Krishnan, G. 2005. Did Huston clients of Arthur Andersen recognize publicly available bad news in a timely manner? *Contemporary Accounting Research* 22 (1): 165-204.

La Porta, R., F. Lopez-De-Silanes, A. Shleifer, and R.W. Vishny. 1997. Legal determinants of external finance. *Journal of Finance* 52 (3): 1131-1150.

La Porta, R., F. Lopez-De-Silanes, A. Shleifer, and R.W. Vishny. 1998. Law and finance. *Journal of Political Economy* 106 (6): 1113-1155.

Landsman, W., K. Nelson, and B. Rountree. 2009. Auditor switches in the pre- and post-Enron Eras: Risk or realignment? *The Accounting Review* 84 (2): 531-558.

Larcker, D.F. and T.O. Rusticus. 2010. On the use of instrumental variables in accounting research. *Journal of Accounting and Economics* 49 (3): 186-205.

Lennox, C.S., J.R. Francis, and Z. Wang. 2012. Selection models in accounting research. *The Accounting Review* 87 (2): 589-616.

Leuz, C., D. Nanda, and P. Wysocki. 2003. Earnings management and investor protection: An international comparison. *Journal of Financial Economics* 69 (3): 505-527.

McGuire, S.T., T.C. Omer, and D. Wang. 2012. Tax avoidance: Does tax-specific industry expertise make a difference? *The Accounting Review* 87 (3): 975-1003.

Palmrose, Z.-V. 1986. Audit fees and auditor size: Further evidence. *Journal of Accounting Research* 24 (1): 97-110.

Reichelt, K.J. and D. Wang. 2010. National and office-specific measures of auditor industry expertise and effects on audit quality. *Journal of Accounting Research* 48 (3): 647-686.

Reynolds, J.K. and J. Francis. 2001. Does size matter? The influence of large clients on office-level auditor reporting decisions. *Journal of Accounting and Economics* 30 (3): 375-400.

Simon, D. and J.R. Francis. 1988. The effects of auditor change on audit fees: Tests of price cutting and price recovery. *The Accounting Review* 63 (2): 255-269.

Simunic, D. 1980. The pricing of audit services: Theory and evidence. *Journal of Accounting Research* 18 (1): 161-190.

Staiger, D. and J.H. Stock. 1997. Instrumental variables regression with weak instruments. *Econometrica* 65 (3): 557-586.

Vera-Muñoz, S., J. Ho, and C. Chow. 2006. Enhancing knowledge sharing in public accounting firms. *Accounting Horizons* 20 (2): 133-155.

Watts, R. and J. Zimmerman. 1986. *Positive Accounting Theory*. Prentice-Hall, Eaglewood Cliffs, N.J., U.S.

Zerni, M. 2012. Audit partner specialization and audit fees: Some evidence from Sweden. *Contemporary Accounting Research* 29 (1): 312-340.

TABLE 1

Percentages of Clients and Audit Fees at the National Level for Australian and U.S. Big 4 Audit Firms and the Next Highest Audit Firm from 2003 to 2010

Panel A: Big 4 Audit Firms

Variable	Country	2003	2004	2005	2006	2007	2008	2009	2010
Fees	Australia	90	90	89	89	89	89	87	87
	U.S.	95	96	94	94	93	93	93	94
Clients	Australia	59	55	52	51	47	45	43	44
	U.S.	66	62	59	55	53	53	54	60

Panel B: Next Highest Australian Audit firm by Fees

Variable	2003	2004	2005	2006	2007	2008	2009	2010
Firm	NAO	NAO	NAO	NAO	PK	PK	BD	BD
Fees	2	2	2	2	2	2	2	2
Clients	<1	<1	<1	<1	7	7	10	11

BD = BDO

NAO = National Audit Office

PK = Pannell Kerr Forster

In this table, audit fees are audit fees paid to all auditors of the entities in the client's group.

TABLE 2

Partner, City, and National Market Shares of Audit Fees from 2003 to 2010

Panel A: Partner, City and National Level Market Shares

Perth				Sydney				Melbourne				Brisbane				Adelaide				National			
Firm		Partner		Firm		Partner		Firm		Partner		Firm		Partner		Firm		Partner		Firm		Partner	
N = 41		N = 130		N = 89		N = 396		N = 51		N = 230		N = 33		N = 105		N = 13		N = 43		N = 177		N = 925	
EY	32	EY	11	PW	31	EY	4	KP	36	KP	8	PW	54	PW	43	EY	45	EY	20	PW	28	PW	4
PW	21	PW	9	EY	26	PW	4	EY	28	EY	5	KP	19	KP	6	KP	15	EY	10	KP	26	KP	2
KP	12	PW	5	KP	25	PW	4	PW	19	EY	5	EY	11	KP	4	PW	15	EY	8	EY	26	EY	2
DT	8	KP	4	DT	10	EY	4	DT	7	KP	4	BD	3	PW	3	GT	13	GT	8	DT	8	PW	2
OTH	27		71		8		84		10		78		13		44		12		54		12		90

(The table is continued on the next page.)

TABLE 2 (Continued)

Panel B: Partner, City and National Level Market Shares

		Perth				Sydney				Melbourne			
		Firm		Partner		Firm		Partner		Firm		Partner	
	GICS Industry	N = 255		N = 600		N = 350		N = 1,043		N = 260		N = 702	
1010	Energy	EY	47	EY	18	KP	35	KP	13	**EY**	**24**	**PWC**	**12**
1510	Materials	PW	37	PW	18	**PW**	**24**	**KP**	**10**	KP	73	KP	25
2010	Capital Goods	EY	41	EY	21	KP	58	KP	12	**EY**	**21**	**DT**	**9**
2020	Commercial & Professional Services	BC	19	BC	14	**PW**	**44**	**DT**	**9**	DT	64	DT	17
2030	Transportation	DT	50	DT	21	KP	57	KP	26	KP	58	KP	35
2510	Automobiles & Components	**EY**	**38**	**KP**	**17**	PK	53	PK	28	KP	46	KP	29
2520	Consumer Durables & Apparel	EY	47	EY	24	**EY**	**28**	**MJ**	**17**	PW	45	PW	18
2530	Consumer Services	DT	45	DT	45	PW	31	PW	11	EY	58	EY	26
2540	Media	PW	79	PW	44	EY	46	EY	30	EY	80	EY	31
2550	Retailing	BD	29	BD	33	EY	46	EY	17	KP	29	KP	22
3010	Food & Staples Retailing	EY	100	EY	54	DT	59	DT	28	PW	69	PW	53
3020	Food, Beverage & Tobacco	KP	50	KP	38	EY	31	EY	16	PW	81	PW	46
3030	Household & Personal Products	BC	67	BC	67	PK	100	PK	100	**BE**	**68**	**WB**	**69**
3510	Health Care Equipment & Services	EY	27	EY	13	EY	30	EY	16	KP	50	KP	23
3520	Pharmaceuticals, Biotechnology & Life Sciences	DT	33	DT	21	**PW**	**29**	**EY**	**13**	EY	49	EY	14
4010	Banks	EY	99	EY	33	**PW**	**63**	**EY**	**25**	EY	59	EY	28
4020	Diversified Financials	EY	39	KP	22	**PW**	**37**	**EY**	**16**	PW	41	PW	17
4030	Insurance	KP	100	KP	100	EY	41	EY	22	PW	49	PW	49
4040	Real Estate	**KP**	**33**	**PW**	**12**	KP	39	KP	13	**PW**	**49**	**EY**	**18**
4510	Software & Services	BC	16	BC	13	EY	19	EY	8	**EY**	**27**	**PW**	**9**
4520	Technology Hardware & Equipment	**DT**	**54**	**EY**	**54**	PW	35	PW	17	**EY**	**26**	**DT**	**17**
4530	Semiconductors & Semiconductor Equipment					**PW**	**56**	**GT**	**37**				
5010	Telecommunication Services	EY	57	EY	27	**PW**	**30**	**KP**	**15**	EY	71	EY	47
5510	Utilities	KP	89	KP	85	DT	42	DT	23	KP	41	KP	39

(The panel is continued on the next page.)

Panel B (Continued)

		Brisbane				Adelaide				National			
		Firm		Partner		Firm		Partner		Firm		Partner	
	GICS Industry	N = 165		N = 346		N = 66		N = 119		N = 641		N = 2,896	
1010	Energy	PW	58	PW	25	EY	49	EY	49	**EY**	**33**	**KP**	**6**
1510	Materials	PW	89	PW	88	PW	43	PW	26	**KP**	**37**	**PW**	**18**
2010	Capital Goods	**PW**	**31**	**EY**	**9**	KP	78	KP	25	KP	39	KP	5
2020	Commercial & Professional Services	BE	37	BE	23	DT	100	DT	66	**PW**	**34**	**DT**	**6**
2030	Transportation	KP	47	KP	35	EY	100	EY	70	KP	54	KP	14
2510	Automobiles & Components					DT	100	DT	80	KP	32	KP	9
2520	Consumer Durables & Apparel	PW	84	PW	44	GT	100	GT	100	PW	36	PW	9
2530	Consumer Services	PW	58	PW	28	BD	80	BD	56	**PW**	**32**	**EY**	**10**
2540	Media	EY	100	EY	62	EY	100	EY	68	EY	52	EY	23
2550	Retailing	PW	43	PW	23	EY	97	EY	52	EY	38	EY	8
3010	Food & Staples Retailing	LH	68	LH	68	PW	100	PW	100	**EY**	**51**	**PW**	**24**
3020	Food, Beverage & Tobacco	EY	60	EY	37	EY	83	EY	60	PW	32	PW	13
3030	Household & Personal Products									PK	49	PK	49
3510	Health Care Equipment & Services	EY	37	EY	20	DT	55	DT	35	KP	29	KP	10
3520	Pharmaceuticals, Biotechnology & Life Sciences	EY	65	EY	42	PW	31	PW	27	EY	40	EY	7
4010	Banks	KP	74	KP	46	EY	100	EY	53	EY	41	EY	13
4020	Diversified Financials	KP	60	KP	45	**PW**	**46**	**KP**	**27**	**PW**	**35**	**EY**	**10**
4030	Insurance	KP	100	KP	60					KP	36	KP	17
4040	Real Estate	**EY**	**39**	**PW**	**29**	EY	58	EY	58	**PW**	**33**	**KP**	**10**
4510	Software & Services	EY	57	EY	20	GT	44	GT	27	**EY**	**26**	**PW**	**4**
4520	Technology Hardware & Equipment	KP	35	KP	26	KP	57	KP	22	**PW**	**21**	**DT**	**6**
4530	Semiconductors & Semiconductor Equipment					GT	70	GT	70	GT	48	GT	25
5010	Telecommunication Services	GT	42	GT	16	EY	67	EY	39	EY	47	EY	27
5510	Utilities	EY	70	EY	35	PW	86	PW	65	**PW**	**28**	**DT**	**12**

(The table is continued on the next page.)

TABLE 2 (Continued)

BC = RSM Bird Cameron
BD = BDO
BE = Bentleys MRI
DT = Deloitte Touche Tohmatsu
EY = Ernst and Young
GT = Grant Thornton
KP = KPMG
LH = Lawler Hacketts
MJ = HLB Mann Judd
OTH = Other audit firms
PK = Pannell Kerr Forster
PW = PriceWaterhouseCoopers
WB = William Buck

The sample size is 13,540 client years from 2003 through 2010.

In this table, audit fees are audit fees paid to the parent entity auditor.

TABLE 3

Descriptive Statistics for the Sample (2003-2010)

Variables	Minimum	Median	Mean	Maximum	Std. Dev.
LAF	0.693	4.756	4.901	10.545	1.336
MSHARE_NAT	0.003	0.248	0.247	0.852	0.144
MSHARE_CIT	0.001	0.249	0.306	1	0.236
MSHARE_PAR	0.00009	0.053	0.132	1	0.196
LEAD_NAT	0	0	0.325	1	0.468
LEAD_CIT	0	0	0.405	1	0.491
LEAD_PAR	0	0	0.162	1	0.368
LTA	2.133	11.445	11.627	20.346	2.446
LSUB	-11.513	1.792	1.001	7.421	3.871
CATA	0	0.362	0.403	1	0.290
QUICK	0	1.359	3.886	20	5.553
DE	0	0.008	0.111	0.767	0.165
ROI	-2.582	0.033	-0.084	0.470	0.417
OPINION	0	0	0.112	1	0.315
YE	0	0	0.189	1	0.392
LOSS	0	1	0.590	1	0.492
SIZEOFF	12.774	17.052	16.810	18.660	1.147
SCALE_CIT	0.290	0.910	0.816	1	0.224
SCALE_PAR	0.390	0.410	0.633	1	0.262
BYSSEG	0	0	0.437	2.079	0.567
GEOSEG	0	0	0.424	2.303	0.542
FEMALE	0	0	0.108	1	0.310
FOREIGN	0	0.167	0.325	1	0.371

N = 6,042. Variables are defined as:

LAF = Natural logarithm of audit fees (in thousand Australian dollars) paid to the auditor of the parent entity;

MSHARE_NAT = Industry market share of the audit firm at the national level;

MSHARE_CIT = Industry market share of the audit firm at the city level;

MSHARE_PAR = Industry market share of the partner;

LEAD_NAT = Indicator variable equal to unity if the audit firm is the first ranked firm by market share of fees in an industry nationally and zero otherwise;

LEAD_CIT = Indicator variable equal to unity if the audit office is the first ranked office by market share of fees in an industry in a city and zero otherwise;

LEAD_PAR = Indicator variable equal to unity if the audit partner is the first ranked partner by market share of fees in an industry in a city and zero otherwise;

(The table is continued on the next page.)

TABLE 3 (Continued)

LSUB = Natural logarithm of the number of subsidiaries, and when the number of subsidiaries equals zero *LSUB* equals the natural logarithm of 0.00001;

CATA = Current assets divided by total assets and it is capped at its 99th percentile value;

QUICK = Current assets less inventories divided by current liabilities and it is capped at its 99th percentile value;

DE = Long-term debt divided by total assets and it is capped at its 99th percentile value;

ROI = Earnings before interest and tax divided by total assets and it is winsorized at its 1st and 99th percentiles;

OPINION = Indicator variable equal to unity if the audit report is qualified or if a going concern opinion audit report is issued, and zero otherwise;

YE = Indicator variable equal to unity if the client's year end is not June 30, and zero otherwise;

LOSS = Indicator variable equal to unity if the client has reported a loss in the last three years, and zero otherwise;

SIZEOFF = Natural logarithm of the sum of audit fees paid by all clients of the office in that fiscal year;

SCALE_CIT = Percentile rank of the city-industry number of clients for each office;

SCALE_ PAR = Percentile rank of the city-industry number of clients for each partner;

BYSSEG = Natural logarithm of the number of business segments;

GEOSEG = Natural logarithm of the geographic of business segments; and

FOREIGN = Number of foreign subsidiaries divided by total subsidiaries
[this variable is only used in the replication of Ferguson et al. (2003)].

TABLE 4

Correlation Matrix

Variables	*LAF*	*MSHARE_NAT*	*MSHARE_CIT*	*MSHARE_PAR*	*LEAD_NAT*	*LEAD_CIT*	*LEAD_PAR*	*LTA*	*LSUB*	*CATA*	*QUICK*	*DE*
MSHARE_NAT	0.184*											
MSHARE_CIT	0.316*	0.478*										
MSHARE_PAR	0.374*	0.211*	0.652*									
LEAD_NAT	0.109*	0.753*	0.339*	0.131*								
LEAD_CIT	0.193*	0.325*	0.759*	0.397*	0.313*							
LEAD_PAR	0.316*	0.156*	0.491*	0.764*	0.115*	0.442*						
LTA	0.802*	0.199*	0.300*	0.325*	0.078*	0.149*	0.256*					
LSUB	0.421*	0.063*	0.126*	0.151*	0.045*	0.089*	0.121*	0.288*				
CATA	-0.148*	-0.078*	-0.042*	-0.048*	-0.008	0.022	-0.028	-0.360*	-0.009			
QUICK	-0.394*	-0.069*	-0.132*	-0.157*	-0.033	-0.051*	-0.122*	-0.298*	-0.192*	0.384*		
DE	0.337*	0.074*	0.132*	0.140*	0.014	0.046*	0.106*	0.367*	0.169*	-0.275*	-0.266*	
ROI	0.293*	0.028	0.095*	0.110*	0.004	0.028	0.076*	0.480*	0.128*	-0.202*	-0.116*	0.151*

(The table is continued on the next page.)

TABLE 4 (Continued)

Variables	*LAF*	*MSHARE_NAT*	*MSHARE_CIT*	*MSHARE_PAR*	*LEAD_NAT*	*LEAD_CIT*	*LEAD_PAR*	*LTA*	*LSUB*	*CATA*	*QUICK*	*DE*
OPINION	-0.110*	-0.030	-0.062*	-0.069*	-0.019	-0.018	-0.043*	-0.267*	-0.025	0.010*	-0.091*	-0.043*
YE	0.189*	0.011	0.039*	0.062*	-0.017	0.002	0.049*	0.200*	0.066*	-0.041*	-0.071*	0.018
LOSS	-0.409*	-0.094*	-0.177*	-0.209*	-0.039*	-0.070*	-0.158*	-0.494*	-0.175*	0.082*	0.237*	-0.208*
SIZEOFF	0.322*	0.164*	0.048*	-0.219*	0.135*	0.079*	-0.136*	0.310*	0.035*	-0.064*	-0.088*	0.130*
SCALE_CIT	-0.163*	0.084*	-0.078*	-0.482*	0.067*	0.059*	-0.269*	-0.091*	-0.097*	-0.044*	0.148*	-0.087*
SCALE_PAR	-0.298*	0.016	-0.108*	-0.122*	-0.006	-0.021	-0.026	-0.186*	-0.146*	-0.071*	0.198*	-0.140*
BYSSEG	0.532*	0.111*	0.187*	0.230*	0.074*	0.103*	0.204*	0.415*	0.289*	-0.060*	-0.270*	0.214*
GEOSEG	0.354*	0.043*	0.089*	0.141*	0.062*	0.065*	0.154*	0.257*	0.226*	-0.015	-0.137*	0.079*
FEMALE	-0.021	-0.043*	-0.024	-0.037*	-0.024	-0.011	-0.042*	-0.050*	-0.022	0.040*	0.022	-0.054*

(The table is continued on the next page.)

TABLE 4 (Continued)

Variables	*ROI*	*OPINION*	*YE*	*LOSS*	*SIZEOFF*	*SCALE_ CIT*	*SCALE_ PAR*	*BYSSEG*	*GEOSEG*
OPINION	-0.381*								
YE	0.090*	-0.059*							
LOSS	-0.399*	0.271*	-0.098*						
SIZEOFF	0.102*	-0.009	0.041*	-0.117*					
SCALE_CIT	-0.078*	0.025*	-0.033*	0.151*	0.254*				
SCALE_PAR	-0.139*	0.035*	-0.043*	0.238*	-0.082*	0.501*			
BYSSEG	0.186*	-0.087*	0.063*	-0.286*	0.099*	-0.171*	-0.235*		
GEOSEG	0.089*	-0.026	0.040*	-0.092*	0.051*	-0.049*	-0.091*	0.223*	
FEMALE	-0.050*	-0.001	0.001	0.025	-0.017	0.003	-0.004	-0.036*	-0.014

The table presents Pearson correlation coefficients. Variables are defined in Table 3. * denotes two-tailed significance at the 1 percent level.

TABLE 5

OLS Regression Results from Audit Fees on Various National-, City-, and Partner-Level Auditor Industry Expertise Variables

Variable	Market share	Top national, city, and partner leaders	Top national and city leaders and top 12 partner leaders
INTERCEPT	-2.610	-2.091	-2.633
	(0.001)	(0.001)	(0.001)
MSHARE_NAT	0.141	-	-
	(0.191)		
MSHARE_CIT	-0.302	-	-
	(0.014)		
MSHARE_PAR	1.192	-	-
	(0.001)		
LEAD_NAT	-	0.026	0.027
		(0.163)	(0.145)
LEAD_CIT	-	-0.009	-0.071
		(0.743)	(0.047)
LEAD_PAR	-	0.343	0.841
		(0.001)	(0.001)
LTA	0.361	0.373	0.349
	(0.001)	(0.001)	(0.001)
LSUB	0.037	0.037	0.033
	(0.001)	(0.001)	(0.001)
CATA	0.636	0.634	0.576
	(0.001)	(0.001)	(0.001)
QUICK	-0.031	-0.031	-0.029
	(0.001)	(0.001)	(0.001)
DE	0.331	0.332	0.259
	(0.006)	(0.007)	(0.016)
ROI	-0.210	-0.221	-0.213
	(0.001)	(0.001)	(0.001)
OPINION	0.177	0.181	0.169
	(0.003)	(0.002)	(0.001)
YE	0.072	0.068	0.062
	(0.102)	(0.111)	(0.127)
LOSS	0.056	0.054	0.060
	(0.170)	(0.190)	(0.129)
SIZEOFF	0.121	0.096	0.123
	(0.001)	(0.001)	(0.001)
SCALE_CIT	0.354	0.076	0.341
	(0.007)	(0.368)	(0.006)
SCALE_PAR	-0.441	-0.342	-0.664
	(0.001)	(0.001)	(0.001)

(The table is continued on the next page.)

TABLE 5 (Continued)

Variable	Market share	Top national, city, and partner leaders	Top national and city leaders and top 12 partner leaders
BYSSEG	0.343	0.336	0.306
	(0.001)	(0.001)	(0.001)
GEOSEG	0.171	0.173	0.163
	(0.001)	(0.001)	(0.001)
FEMALE	0.063	0.058	0.084
	(0.110)	(0.149)	(0.038)
LEAD_PAR2	-	-	0.594
			(0.001)
LEAD_PAR3	-	-	0.514
			(0.001)
LEAD_PAR4	-	-	0.425
			(0.001)
LEAD_PAR5	-	-	0.416
			(0.001)
LEAD-PAR6	-	-	0.365
			(0.001)
LEAD_PAR7	-	-	0.300
			(0.001)
LEAD_PAR8	-	-	0.251
			(0.001)
LEAD_PAR9	-	-	0.294
			(0.001)
LEAD_PAR10	-	-	0.146
			(0.010)
LEAD_PAR11	-	-	0.174
			(0.027)
LEAD_PAR12	-	-	0.171
			(0.003)
Year Indicators	Yes	Yes	Yes
Industry Indicators	Yes	Yes	Yes
Adjusted R^2	81.62%	81.20%	82.55%
Highest VIF	3.418	1.629	3.197
N	6,042	6,042	6,042

The dependent variable is *LAF*, natural logarithm of audit fees paid to the auditor of the parent entity. *LEAD_PAR2* is an indicator for partners who are the second ranked partner in a city industry in a year, and *LEAD_PAR3* through *LEAD_PAR12* are defined similarly. All other variables are defined in Table 3.

All regressions are estimated using OLS with standard errors clustered by client and year as in Gow et al. (2010). The *p*-values from two-tailed significance tests are reported in parentheses below each coefficient estimate using 8 degrees of freedom (8 years) as in Gow et al. (2010).

TABLE 6

Regression Results from Extension of Methodologies in Prior Studies

Variable	Full sample	Excluding partner leader	Including partner leader	Including partner market share
INTERCEPT	-1.819	-1.585	-2.066	-2.563
	(0.001)	(0.001)	(0.001)	(0.001)
ONLY NAT LEADER	-0.007	-0.024	-0.016	-0.030
	(0.736)	(0.292)	(0.451)	(0.187)
ONLY CITY LEADER	0.080	-0.001	-0.039	-0.064
	(0.008)	(0.955)	(0.166)	(0.047)
JOINT NAT_CITY LEADER	0.134	0.019	0.031	-0.017
	(0.001)	(0.575)	(0.317)	(0.623)
LEAD_PAR	-	-	0.347	-
			(0.001)	
MSHARE_PAR	-	-	-	0.983
				(0.001)
LTA	0.386	0.352	0.373	0.362
	(0.001)	(0.001)	(0.001)	(0.001)
LSUB	0.037	0.039	0.037	0.037
	(0.001)	(0.001)	(0.001)	(0.001)
CATA	0.648	0.614	0.635	0.631
	(0.001)	(0.001)	(0.001)	(0.001)
QUICK	-0.032	-0.032	-0.032	-0.031
	(0.001)	(0.001)	(0.001)	(0.001)
DE	0.344	0.451	0.333	0.328
	(0.005)	(0.001)	(0.007)	(0.007)
ROI	-0.235	-0.181	-0.221	-0.214
	(0.001)	(0.001)	(0.001)	(0.001)
OPINION	0.190	0.176	0.180	0.179
	(0.002)	(0.002)	(0.002)	(0.003)
YE	0.072	0.078	0.067	0.070
	(0.098)	(0.101)	(0.117)	(0.112)
LOSS	0.047	0.019	0.054	0.056
	(0.239)	(0.606)	(0.194)	(0.169)
SIZEOFF	0.076	0.078	0.096	0.119
	(0.001)	(0.001)	(0.001)	(0.001)
SCALE_CIT	-0.092	0.010	0.070	0.254
	(0.242)	(0.911)	(0.398)	(0.022)
SCALE_PAR	-0.234	-0.266	-0.341	-0.408
	(0.011)	(0.003)	(0.001)	(0.001)

(The table is continued on the next page.)

TABLE 6 (Continued)

Variable	Full Sample	Excluding partner leader	Including partner leader	Including partner market share
BYSSEG	0.347	0.307	0.336	0.342
	(0.001)	(0.001)	(0.001)	(0.001)
GEOSEG	0.189	0.166	0.173	0.174
	(0.001)	(0.001)	(0.001)	(0.001)
FEMALE	0.045	0.032	0.057	0.060
	(0.266)	(0.406)	(0.156)	(0.126)
Year Indicators	Yes	Yes	Yes	Yes
Industry Indicators	Yes	Yes	Yes	Yes
Adj. R^2	80.66%	78.05%	81.22%	81.69%
Highest VIF	1.291	1.298	1.466	1.532
N	6,042	5,302	6,042	6,042

The dependent variable is *LAF*, natural logarithm of audit fees paid to the auditor of the parent entity.

ONLY CITY LEADER = Unity of the audit office which audits the client is the city leader in that industry and the office's audit firm is not the industry leader nationally, and zero otherwise;

ONLY NAT LEADER = Unity if the audit office which audits the client is from the industry leader audit firm nationally and the office is not the industry leader in that city, and zero otherwise; and

JOINT CITY-NAT LEADER = Unity if the audit office which audits the client is from the industry leader audit firm nationally and the office is the city leader in that industry, and zero otherwise.

Other variables are defined in Table 3.

The *p*-values from two-tailed significance tests are reported in parentheses below each coefficient estimate.

TABLE 7

Regression Results from Ferguson et al. (2003) and from Replication and Extension of Ferguson et al. (2003)

Variable	Ferguson et al. (2003)	Replication of Ferguson et al. (2003)	Excluding partner leader	Including partner leader	Including partner market share
INTERCEPT	-1.45	-1.36	-0.90	-1.20	-1.23
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
JOINT CITY-NAT2 LEADER	0.213	0.216	0.085	0.108	0.111
	(0.002)	(0.001)	(0.258)	(0.123)	(0.112)
ONLY CITY LEADER	-0.081	-0.197	-0.291	-0.364	-0.339
	(0.338)	(0.027)	(0.013)	(0.001)	(0.001)
ONLY NAT2 LEADER	-0.018	-0.067	-0.073	-0.075	-0.064
	(0.684)	(0.300)	(0.262)	(0.239)	(0.317)
PARTNER LEADER	-	-	-	0.365	-
				(0.001)	
MSHARE_PAR	-	-	-	-	0.619
					(0.001)
LTA	0.46	0.46	0.42	0.44	0.44
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
LSUB	0.05	0.05	0.05	0.05	0.05
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
CATA	0.93	0.80	0.73	0.80	0.80
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
QUICK	-0.03	-0.04	-0.03	-0.04	-0.04
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
DE	0.79	0.50	0.45	0.44	0.45
	(0.001)	(0.010)	(0.036)	(0.023)	(0.029)
ROI	-0.46	-0.58	-0.53	-0.55	-0.55
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
FOREIGN	0.69	0.70	0.52	0.69	0.69
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
OPINION	0.01	0.05	0.01	0.03	0.05
	(0.885)	(0.567)	(0.986)	(0.715)	(0.611)
YE	0.01	0.08	0.06	0.08	0.08
	(0.857)	(0.182)	(0.419)	(0.217)	(0.192)
LOSS	0.01	0.06	-0.01	0.06	0.07
	(0.984)	(0.366)	(0.980)	(0.294)	(0.252)
Year Indicators	No	No	No	No	No
Industry Indicators	No	No	No	No	No
Adj. R^2	80%	79.62%	73.71%	80.06%	80.06%
Highest VIF	N/A	1.367	1.205	1.547	1.538
N	681	705	581	705	705

(The table is continued on the next page.)

TABLE 7 (Continued)

The dependent variable is *LAF_ALL*, natural logarithm of total audit fees.

ONLY CITY LEADER = Unity of the audit office which audits the client is the city leader in that industry and the office's audit firm is not from one of the top two industry leader audit firms nationally, and zero otherwise;

ONLY NAT2 LEADER = Unity if the audit office which audits the client is from one of the top two the industry leader audit firms nationally and the office is not the industry leader in that city, and zero otherwise; and

JOINT CITY-NAT2 LEADER = Unity if the audit office which audits the client is from one of the top two the industry leader audit firms nationally and the office is the city leader in that industry, and zero otherwise.

Other variables are defined in Table 3.

The *p*-values from two-tailed significance tests are reported in parentheses below each coefficient estimate.

TABLE 8

Intraclass Correlation and Regression Coefficients for the Full Sample

	Intraclass Correlation Coefficients		Regression Estimates	
Variable	Within-client	Within-partner	Coefficient	*p*-value
MSHARE_NAT	0.624	0.312	0.248	0.001
MSHARE_CIT	0.679	0.315	0.497	0.001
MSHARE_PAR	0.749	0.353	1.169	0.001
NAT_LEAD	0.407	0.182	0.033	0.038
CIT_LEAD	0.474	0.253	0.089	0.001
PAR_LEAD	0.516	0.238	0.209	0.001

Regression estimates are obtained by including only one of the auditor expertise variables at a time in model (1) plus client and partner fixed effects. All estimations are performed using the main sample of 6,042 client years.

TABLE 9

Client and Client and Partner Fixed Effects Regression Results from Audit Fees on Various National-, City-, and Partner-Level Auditor Industry Expertise Variables

	Market Share		Top National, City and Partner Leaders		Top National and City Leaders and Top 12 Partner leaders	
Variable	C	C, P	C	C, P	C	C, P
MSHARE_NAT	0.135	0.107	-	-	-	-
	(0.048)	(0.141)				
MSHARE_CIT	0.017	0.073	-	-	-	-
	(0.752)	(0.219)				
MSHARE_PAR	0.907	1.105	-	-	-	-
	(0.001)	(0.001)				
LEAD_NAT	-	-	0.020	0.021	0.020	0.024
			(0.196)	(0.189)	(0.188)	(0.122)
LEAD_CIT	-	-	0.032	0.038	0.025	0.028
			(0.055)	(0.033)	(0.120)	(0.106)
LEAD_PAR	-	-	0.181	0.190	0.562	0.674
			(0.001)	(0.001)	(0.001)	(0.001)
LTA	0.295	0.275	0.300	0.282	0.292	0.270
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
LSUB	0.009	0.008	0.009	0.009	0.008	0.008
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
CATA	0.169	0.164	0.166	0.163	0.151	0.158
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
QUICK	-0.017	-0.017	-0.016	-0.016	-0.015	-0.016
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
DE	0.159	0.108	0.151	0.109	0.099	0.056
	(0.005)	(0.059)	(0.008)	(0.063)	(0.078)	(0.323)
ROI	-0.165	-0.160	-0.173	-0.163	-0.172	-0.157
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
OPINION	0.127	0.096	0.130	0.105	0.130	0.104
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
YE	0.060	0.051	0.114	0.077	0.142	0.115
	(0.303)	(0.417)	(0.055)	(0.229)	(0.014)	(0.065)
LOSS	0.087	0.075	0.093	0.086	0.093	0.083
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
SIZEOFF	0.067	0.069	0.055	0.074	0.066	0.073
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
SCALE_CIT	0.228	0.236	0.096	0.112	0.199	0.236
	(0.001)	(0.001)	(0.080)	(0.062)	(0.001)	(0.001)
SCALE_PAR	-0.186	-0.162	-0.080	-0.034	-0.349	-0.355
	(0.001)	(0.001)	(0.024)	(0.390)	(0.001)	(0.001)
BYSSEG	0.130	0.112	0.129	0.113	0.115	0.098
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)

(The table is continued on the next page.)

TABLE 9 (Continued)

	Market Share		Top National, City and Partner Leaders		Top National and City Leaders and Top 12 Partner leaders	
Variable	C	C, P	C	C, P	C	C, P
GEOSEG	0.062	0.053	0.068	0.064	0.066	0.060
	(0.001)	(0.004)	(0.001)	(0.001)	(0.001)	(0.001)
FEMALE	0.003	-	0.013	-	0.042	-
	(0.889)		(0.571)		(0.057)	
LEAD_PAR2	-	-	-	-	0.460	0.561
					(0.001)	(0.001)
LEAD_PAR3	-	-	-	-	0.358	0.458
					(0.001)	(0.001)
LEAD_PAR4	-	-	-	-	0.325	0.393
					(0.001)	(0.001)
LEAD_PAR5	-	-	-	-	0.302	0.359
					(0.001)	(0.001)
LEAD-PAR6	-	-	-	-	0.245	0.317
					(0.001)	(0.001)
LEAD_PAR7	-	-	-	-	0.265	0.320
					(0.001)	(0.001)
LEAD_PAR8	-	-	-	-	0.200	0.265
					(0.001)	(0.001)
LEAD_PAR9	-	-	-	-	0.169	0.205
					(0.001)	(0.001)
LEAD_PAR10	-	-	-	-	0.061	0.094
					(0.091)	(0.010)
LEAD_PAR11	-	-	-	-	0.104	0.150
					(0.004)	(0.001)
LEAD_PAR12	-	-	-	-	0.091	0.091
					(0.013)	(0.015)
Year Indicators	Yes	Yes	Yes	Yes	Yes	Yes
Industry Indicators	Yes	Yes	Yes	Yes	Yes	Yes
Adj. R^2	92.38%	93.13%	92.14%	92.81%	92.56%	93.29%
F-statistics	6.028***	1.241***	5.942***	1.060	6.817***	1.235***
Highest VIF	8.676	11.719	3.072	3.686	6.706	9.071
N	6,042	6,042	6,042	6,042	6,042	6,042

The dependent variable is *LAF*, natural logarithm of audit fees paid to the auditor of the parent entity. *LEAD_PAR2* is an indicator for the partner who is the second ranked partner in a city industry in a year, and *LEAD_PAR3* through *LEAD_PAR12* are defined similarly. All other variables are defined in Table 3.

Columns labelled "C" are for regressions that include the client fixed effects, and columns labelled "C, P" are for regressions that include both the client and partner fixed effects. The *p*-values from two-tailed significance tests are reported in parentheses below each coefficient. The F-statistics in columns "C" are for the F-test of the joint significance of client fixed effects. In columns "C, P", the F-statistics are for the F-test of the joint significance of partner fixed effects.

*** denotes the F-statistics are significant at 1 percent level.