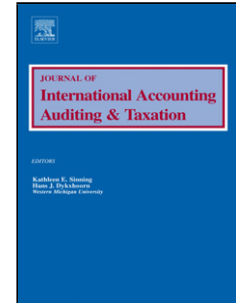


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**Abstract**

This study investigates the effects of audit partner industry specialization on audit pricing in the UK market. The mandatory disclosure of the name of the engagement partner in the auditor reports of UK public listed companies took effect from April 2008. Given that the identity of the audit partner is now observable to users of financial statements, it can be argued that there may be an incentive for partner-level differentiation in auditing products, and hence, audit quality. This research examines whether auditor industry expertise in the UK is driven by firm, office, or partner level expertise. The fee premium observed in the study is a joint product of firm and partner level of industry expertise with the highest premium occurring when the client is also audited by an industry leading partner. This finding lends support to the argument that industry expertise is uniquely attributable to the individual audit partner's human capital in terms of their knowledge and experience from leading audit engagements in a particular industry. It also provides evidence that some fee premiums earned by audit firms and documented in prior literature are most probably the product of the individual audit partner's expertise.

**Keywords:** audit partner, audit pricing, audit fee premium, industry specialization, United Kingdom

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## Partner industry specialization and audit pricing in the United Kingdom

### 1. Introduction

There is a well-established literature examining whether auditors earn a fee premium by specializing in particular industries (Craswell, Francis, & Taylor, 1995; Francis, Reichelt, & Wang, 2005; Minutti-Meza, 2013). However, most previous research examines specialization by firms at the national level or city level. This study investigates the effects of industry specialization by individual audit partners in the UK market.

Accounting firms are generally organized as partnerships, and this provides them with a structure that allows optimal delegation of the decision rights to the partner level where relevant specific knowledge is located (Fama & Jensen, 1983).<sup>1</sup> Partners play the central role in planning and administering the external audit service provided to the client and are accountable for the final audit report that they sign (Chin & Chi, 2009). Partner autonomy suggests that audit outcomes vary with partners' characteristics, including their expertise; and that the accounting firms nationally or even the individual engagement offices of the accounting firms play a less important role in administering audit engagements (Goodwin & Wu, 2014).

Extant literature in auditing implicitly assumes that industry expertise is homogeneous across individual partners within the same audit firm (national level perspective) (Balsam, Krishnan, & Yang, 2003; Krishnan, 2003) or within the same city for a given firm (office level perspective) (Francis et al., 2005; Reichelt & Wang, 2010). This literature assumes that knowledge can be shared through practices such as internal benchmarking of best practices, use of standardized industry tailored audit programs, and extending the reach of professionals from their primary local-office clientele to other clients through travel and internal consultative practices (Ferguson, Francis, & Stokes, 2003).

Nevertheless, it is arguable whether the audit partner's deep knowledge and expertise can be fully transferred between offices or partners (Chin & Chi, 2009). Individual industry expertise develops from individual personal beliefs, experiences, and values not easily transferred (Ambrosini

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<sup>1</sup> Although firms are now permitted to incorporate, they generally continue to structure themselves as if they were partnerships, and use the designation "partner".

& Bowman, 2001; Carcello & Nagy, 2004; Nagy, 2014). Besides, not all types of industry knowledge can be documented and transferred, and an individual audit partner's professional judgement is unique and is controlled by the innate ability of the individual partner (Vera-Munoz, Ho, & Chow, 2006). In addition, there are factors that deter auditors from sharing what they know with others. For example, the pursuit of personal benefits and power by individual auditors, constraints and workload pressure that reduce knowledge sharing efforts, or inadequacy in audit firms' information technology may deter auditors from sharing their knowledge with others (Vera-Munoz et al., 2006).

Based on these competing views, we cannot rule out the presence of office or firm level industry leadership effects on audit pricing and quality. While it is evident that a partner's industry specialization plays an important role in audit quality in the US (Nagy, 2014), Sweden (Zerni, 2012), Australia (Goodwin & Wu, 2014), and Taiwan (Chin & Chi, 2009), the extent to which partner industry expertise contributes to higher audit quality still remains an unanswered empirical question in the UK audit market. Previous studies in the UK showed that city-industry specialization was important, but not national specialization (Basioudis & Francis, 2007), and later that both national and industry level specialization was needed in order to earn an audit fee premium (Mohd Kharuddin & Basioudis, 2018). Thus, this study examines whether industry expertise at the partner level is independently associated with audit pricing. While the issue of partner specialization has been studied, using data from the US and Australia (Nagy, 2014; Goodwin & Wu, 2014), the UK has been shown to be different from those countries so far as auditor specialization is concerned (Basioudis & Francis, 2007).

Our findings suggest that the fee premium attached to auditor industry expertise is a joint product of firm and partner level of industry expertise, unlike the situation in the US and Australia. The fee premium is highest when the client is also audited by the leading industry partner. These findings provide evidence that partner industry leadership is an important condition, but not a necessary condition for a fee premium in the UK audit market. The findings provide support for the argument that industry expertise is uniquely attributable to the individual audit partner's human capital. The evidence also confirms recent results that in the UK there is a shift of industry

specialization from the city level (Basioudis & Francis, 2007) to the national level (Mohd Kharuddin & Basioudis, 2018).

The results of this study are of interest in understanding the economic importance of investing in partner industry specialization. The results are also relevant in assessing the impact of the mandatory disclosure of a partner's identity in the UK audit market, and in reassessing the impact of the mandatory rotation of audit partners and audit firms. Whether auditor specialization fee premiums are related to a particular person (partner), or team, or to the audit firm as a whole is a relevant question to audit committees, analysts, and regulators, as it reflects on whether audit quality is uniform for a firm or office, or varies by partner. Such information could be important in choosing an auditor or deciding whether to rely on a set of accounts. Thus, investigating the issue sheds some light on this under researched topic.

In the next section, we provide a review of prior research which leads to the development of hypotheses. Then the description of the sample, data, and audit fee model used in the study are presented. This is followed by a discussion of the results of the multivariate analyses, as well as various sensitivity analyses performed to confirm our initial findings. The final part of the paper concludes and discusses the implications of the research.

## **2. Prior research and hypotheses development**

Auditor industry specialization is a product differentiation strategy adopted by audit firms to differentiate themselves from competitors in fulfilling clients' demands for better financial reporting quality (Krishnan, 2003; Dunn & Mayhew, 2004) and to compete on other than cost-price strategy alone (Habib, 2011; Gramling & Stone, 2001; Mayhew & Wilkins, 2003). By concentrating resource and technology investments in a particular focus industry or a number of industries, audit firms are able to gain efficiency through economies of scale (Eichenseher & Danos, 1981; Cairney & Young, 2006) and build a reputation as an industry expert. It is believed that a reputation as a specialist will provide firms with a competitive advantage and greater market power, and the ability to charge an audit fee premium (Francis, 1984; Causholli, Martinis, Hay, & Knechel, 2010; Hay & Jeter, 2011). It is not yet clear from research whether industry specialist knowledge is held by the individual auditors

or by the firm as a whole through the firm's databases and other resources. Previous papers investigating the issue of national versus city level specialization use city level results to examine whether specialization is held by the firm as a whole, or whether it resides in individuals (Ferguson et al., 2003, p. 433). A widely accepted view is that industry expertise is "neither strictly national nor strictly local in character" (Francis et al., 2005, p. 114). Those earlier studies use city level as an indication of individual expertise; whereas in this study we are able to look more precisely at individual expertise as well as at the city and national levels.

Many studies report a positive relationship between auditor industry (national) specialization and audit fees (Ferguson et al., 2003; Mayhew & Wilkins, 2003; Francis et al., 2005; Carson, 2009; Cahan, Jeter, & Naiker, 2011; Fung, Gul, & Krishnan, 2012; Mohd Kharuddin & Basioudis, 2018), but many others provide somewhat different conclusions. For example, other studies provide weak results or insignificant findings (Palmrose, 1986; Pearson & Trompeter, 1994; Ferguson & Stokes, 2002; Ferguson et al., 2006; Basioudis & Francis, 2007), contrary evidence (Minutti-Meza, 2013), or a fee discount for non-specialists (Ettredge & Greenberg, 1990; Hay & Jeter, 2011). The mixed results obtained at the national level could be due to the different industry specialization measures used, and to the country and the period analyzed (Craswell et al., 1995; Ferguson & Stokes, 2002; Huang, Liu, Raghunandan, & Rama, 2007; Causholli et al., 2010; Hay & Jeter, 2011). But there are also arguments that the methodology used in these studies does not adequately separate auditor expertise from client characteristics (Minutti-Meza, 2013). However, although Minutti-Meza (2013) suggests that the auditor's within-industry market share is not a reliable indicator of audit quality, he also concludes that nevertheless, the findings do not imply that industry knowledge is not important for auditors.

Other studies on auditor industry specialization examine the effect of the Big 4 industry leadership on audit pricing using the national-city framework developed by Ferguson et al. (2003). These studies examine whether national (firm level) reputations or city reputations (office level) for industry expertise are more valued and more highly priced in the audit market (Ferguson et al., 2003; Francis et al., 2005; Basioudis & Francis, 2007; Hay & Jeter, 2011; Mohd Kharuddin & Basioudis, 2018). Whether the audit pricing is dominated by firm level or office level industry expertise might

explain the strength of knowledge sharing and transfer of industry expertise between city offices of the audit firms. The results of this line of research are also so far inconclusive. The extent to which auditing is centralized across audit firms can also change over time, and it was suggested that there is a trend towards greater centralization (Bedard, Deis, Curtis, & Jenkins, 2008).

In the US and Australia, auditors' industry expertise based on joint national and city reputation matters more in the Big 4 audit market, as they are priced at a higher rate as compared to national industry leadership alone or city specific industry leadership alone (Ferguson et al., 2003; Francis et al., 2005). In contrast, in the UK and New Zealand the industry specialization premium for city industry leadership alone appears to be higher than joint national and city specific industry leadership (Basioudis & Francis, 2007; Hay & Jeter, 2011). For the UK audit market, a more recent study by Mohd Kharuddin and Basioudis (2018) documented significantly higher fee premium for the Big 4 firms who are national industry leaders as compared to city specific industry leaders, and that the fee premium for industry leadership is only earned by the city specific industry leaders if and when they are also the national leaders. This recent evidence shows that neither national nor city level industry leadership alone is priced in the UK audit market.

There are reasons to expect that the UK audit market is different from other settings in which the specialization issue is examined, because although the major cities are geographically close, there are cultural differences among cities or regions. For example, the two largest cities in the UK, London and Birmingham, are one hour and 25 minutes apart by train. Further afield, Edinburgh (the capital of Scotland) and Glasgow (the largest city in Scotland) are about an hour distant. Some other major cities that are culturally distinct, such as Manchester and Liverpool, are even closer to each other. Despite the physical closeness, there are also substantial cultural differences among cities. For example, there are many regional dialects and accents, and most people speak some form of regional accent or dialect (Hughes, Trudgill, & Watt, 2012, p. 16). These differences in speech reflect regional cultural differences, which may explain why city-industry specialization is found to be so important in UK studies like Basioudis and Francis (2007). It is also the case that over the long term, the differences among cities and regions are tending to weaken. This is likely to be a slow and long-term trend, but it might have some influence on national specialization becoming more important.



The evidence<sup>2</sup> suggests that the market in the UK has moved away from the previously documented premium for city specific industry leadership alone, and that the auditor specialization premium applies to joint expertise at the national and city specific levels concurrently. Mohd Kharuddin and Basioudis (2018) indicates that there was a switch from city specific industry expertise to national-specific industry expertise. This trend implies that there has been an improvement in the sharing and transferability of industry knowledge and expertise among the city offices of the Big 4 firms in the UK. This is consistent with the trend toward centralization within audit firms observed by Bedard et al. (2008).

Researchers have lately started focusing on industry expertise at the audit partner level. This is based on the argument that audit partner depth of knowledge, experience, and expertise dealing with clients within a specific industry is a unique “private human capital” and cannot be easily shared<sup>3</sup> with other partners or staff within the same audit firm (Chi & Chin, 2011). Audit quality is not only attributed to the brand name of the audit firm, but is also affected by the individual partner’s characteristics and reputation (Goodwin & Wu, 2014).

In their study in Australia for the period 2003-2010, Goodwin and Wu (2014) report evidence of a premium only for companies audited by partners who are industry leaders at the city level, suggesting that the partner level expertise is the driver of the previous documented audit firm fee premiums for industry expertise. On the other hand, Nagy (2014) found evidence using restricted US data (based on Andersen clients) in the period 2001-2002 suggesting that there are fee premiums attached to both the city-industry leading audit partner and to the audit firm that is a city specific industry leader. Zerni (2012) also reported a fee premium for partner industry specialization in Sweden during 2003-2007.

Previous UK studies were not able to examine specialization at the partner level. Partner specialization is a crucial component in understanding auditor specialization premiums, and whether

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<sup>2</sup> Other recent UK studies on related topics report that audit fees and audit quality increased after the PricewaterhouseCoopers merger (Ding & Jia, 2012); confirm a Big 4 audit fee premium and higher audit quality (Campa, 2013); and show audit committee expertise is associated with higher audit fees (Ghafran & O’Sullivan, 2017).

<sup>3</sup> This is due to the difficulty in documentation or transfer of data/information (e.g. papers, databases), the involvement of professional judgment in various considerations, and the gap in knowledge-sharing through the use of IT-based expert knowledge systems (Vera-Munoz et al., 2006).

specialist knowledge is held by the firm as a whole or by individuals. This study investigates more recent evidence, including partner-level data, from UK listed companies.

In 2008, the UK regulator, the Financial Reporting Council (FRC), proposed an audit quality framework showing that audit partner skills, knowledge, and expertise are important drivers of audit quality (FRC, 2008). However, whether a fee premium for industry expertise is attributable to partners within a city office is yet to be investigated in the UK. The disclosure of the name of the senior statutory auditor (or engagement partner) signing off the auditor's report for and on behalf of the audit firm is mandatory in the UK since 6 April 2008 (Section 503 of Companies Act 2006). This legal requirement made it possible to examine the effect of the individual audit partner. Thus, this study represents a response to the call from academics (DeFond & Francis, 2005) and policy makers for more scrutiny and understanding of audit quality at the individual audit partner level. Consistent with this, the first hypothesis is as follows:

*H1: Industry expertise at the partner level is associated with a fee premium in the UK market for audit services*

Nevertheless, in arguing for a partner element of industry expertise, we cannot rule out the presence of an office or firm level industry leadership effects on audit quality. Thus, we specify the second hypothesis as follows:

*H2: Industry expertise at the firm and office levels is associated with a fee premium in the UK market for audit services*

### **3. Research design**

#### *3.1. Data Collection*

The research sample in this study comprises all companies listed on the London Stock Exchange (LSE) for the financial years 2009 and 2011, with information available in the FAME

database<sup>4</sup>. The sample year starts in 2009 as this is the first year with all listed companies in the LSE having to disclose the name of the engagement partner in their annual reports. The sample captures the effect of audit partner specialization on audit pricing in the UK (if any) in the first three years of the enactment of the new disclosure regulation. We manually collected data on the location of the accounting firm's lead engagement office and the name of the audit partner from the letterhead of the audit reports.

This data is used to analyze the firm's national industry leadership, the firm's city specific industry leadership, and an audit partner's industry leadership separately and per year. The firm's national industry leadership is determined based on the accounting firm's share of aggregate industry audit fees. City specific industry leadership is determined based on the accounting firm's share of aggregate industry audit fees for each city. The audit partner's industry leadership is determined based on the individual partner's share of aggregate industry audit fees for each city. Following Mohd Kharuddin and Basioudis (2018), the industry classification used is based on the FAME categorization of major industry sectors, where LSE industry codes (SIC codes) are categorized into 13 major industry sectors<sup>5</sup>.

The initial sample comprises 7,222 companies listed on the LSE between 2009 and 2011, which was screened to exclude small and dormant companies not followed by FAME, companies from the financial services sector, public administration and defense, health and education, and other services firms, and companies with incomplete financial data. This results in a sample of 1,335 observations with complete audit fees data that we used to calculate the various audit firm and partner industry market shares. As this study aims to test whether Big 4 industry leaders have a fee premium relative to other Big 4 firms who are non-leaders, we exclude 439 non-Big 4 observations from the sample, resulting in 896 observations. Similar to prior research (Francis et al., 2005, Basioudis & Francis, 2007), a further 216 observations from the sample with less than two city specific observations per industry are also excluded. This additional screening is performed to ensure that the

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<sup>4</sup> FAME is an abbreviation for "Financial Analysis Made Easy," a comprehensive database for UK companies compiled by Bureau Van Dijk.

<sup>5</sup> We test the sensitivity of this industry categorization later in the paper.

audit market in all cities in the sample is competitive where more than one audit client exists. The sample screening process for the final sample of 680 observations is summarized in Table 1.

[INSERT TABLE 1 HERE]

Additional analysis of the audit market in the period 2009-2011 reveals that on average 44 percent of companies in the sample are audited by London offices of the Big 4 firms, and paid an annual average 82 percent of all audit fees. The three largest cities after London are Birmingham, Manchester, and Leeds. Thirty-three percent of sample companies are headquartered in London, with only 53 percent of them audited by London offices, and the remaining by audit offices geographically not far outside of London. The remaining 67 percent of sample companies are located in cities outside of London and all are audited by non-London offices of the Big 4 audit firms. This analysis of concentration shows that the audit market in the UK is dominated by London. This is not surprising given its role as the largest commercial center in the UK.

Despite the dominance of London as a leading international financial center, there are a large number of cities, mostly in close proximity, in the UK. For example, metropolitan Birmingham (the second largest city in the UK) is about 120 miles northwest of London, and about 80 miles south of Manchester (the third largest city in the UK). Some other major cities, such as Leeds and Liverpool, are even closer to each other (70 miles apart), and in between is the city of Manchester. The capital of Scotland, Edinburgh, and Glasgow (the largest city in Scotland) are about an hour distant. Moreover, the geographical size of the UK relative to countries like the US and Australia is smaller, and given the position of London as the primary commercial center, it makes the role of city offices for audit firms less crucial in administering audit engagements, and provides the potential ability to audit firms to easily transfer knowledge and expertise among their offices (although this effect could be countered by the cultural differences discussed earlier).

In the final sample of 680 companies, 183 clients are audited by industry specialist audit partners. The sample includes 86 unique individual partners over the three years of our study. 21 percent of these partners are located in a London office and 79 percent of them are male. PwC has the highest number of partners in the sample (41 percent), followed by KPMG (23 percent), and Deloitte and EY (18 percent each).

### 3.2. Audit Fee Model

For comparative purposes, we adopt the same audit fee model used in previous UK studies (Mohd Kharuddin & Basioudis, 2018, Basioudis & Francis, 2007). The industry fixed-effects and year fixed-effects are included in the audit fee model to control for systematic differences in fees across the 13 industries and three years period examined in the sample. The ordinary least squares (OLS) regression model is specified as follows:

$$\begin{aligned} LAF = & \alpha + \beta_1 LNAF + \beta_2 LTA + \beta_3 SQRTSUBS + \beta_4 ROI + \beta_5 DE + \beta_6 FOREIGN \\ & + \beta_7 QUICK + \beta_8 CATA + \beta_9 OPINION + \beta_{10} LONDON + \beta_{11} BUSY + \beta_{12} LOSS \\ & + \beta_{13} INITIAL + \beta_{14} AUDITOR + \varepsilon \end{aligned}$$

The definition of the model variables is listed in Table 2.

[INSERT TABLE 2 HERE]

Consistent with prior research (Whisenant Sankaraguruswamy & Raghunandan, 2003; Francis et al., 2005; Basioudis & Francis, 2007; Choi, Kim, Kim, & Zang, 2010), higher audit fees are expected for the following variables: large size clients (*LTA*), clients with greater audit complexity (*SQRTSUBS* and *FOREIGN*) and greater audit risk (*CATA*, *DE*, and *LOSS*), London-based companies (*LONDON*), *OPINION* report, simultaneous provision of allowed non-audit services to clients (*LNAF*), and the (*BUSY*) season for the auditor. On the other hand, lower audit fees are expected for the following variables: higher values of the risk variables *QUICK* and *ROI*, and the *INITIAL* variable standing for the lowballing effect if an audit represents the first or second year of engagement. Finally, the coefficient of the *AUDITOR* variable represents the magnitude of the audit fee premium under different definitions of industry specialist auditor as explained earlier.

### 3.3 Descriptive Statistics and Correlation Matrix

Descriptive statistics for the full sample (Panel A) and various different subsamples (Panels B-E) are reported in Table 3. Panel A includes the descriptive statistics for the 680 sample companies. Panels B-E provide descriptive data and mean differences for various specialist partner definitions

against the non-specialists, as follows: Panel B splits the companies according to whether they are audited by a Big 4 industry specialist partner; Panel C splits UK listed companies audited by a Big 4 joint national and city-specific industry specialist against companies audited by non-specialist auditors; Panel D displays the descriptives for companies audited by a Big 4 city-specific industry specialist only (i.e., not national industry) against all others; and, finally Panel E splits the data according to whether a company is audited by a national industry specialist only (i.e., not city-specific).

There is no prior study in the UK that examines audit partner data, so we cannot compare directly our data to prior UK research. However, our descriptives are similar to Mohd Kharuddin and Basioudis (2018), who examined the UK audit market (but without audit partner data), with the exception of the variables *INITIAL* and *SUBS*, which are smaller in the current study.

The average of some variables, such as the *LAF*, *LTA*, and *LONDON*, is significantly different between the two subsamples of specialists against the non-specialists ( $p < 0.05$ ) in Panels B-E. Others, such the *DE* and *OPINION*, show less variation and consistently are not significantly different between the various subsamples of specialist and non-specialist auditors ( $p > 0.05$ ). Comparing more directly between the different specialist subsamples in Panels B-E, clients of the Big 4 joint national and city-specific industry leaders are slightly larger in size (*LTA*), pay relatively higher audit fees (*LAF*), have more clients located in London (*LONDON*), possess higher audit complexity (*FOREIGN*), and are more profitable (*ROI*). Clients of the Big 4 city-specific industry leaders but not national industry leaders make more losses (*LOSS*), have lower audit complexity (*SQRTSUBS*), and pay relatively lower non-audit fees (*LNAF*) compared to the other Big 4 industry leaders. Whereas clients of the Big 4 national industry leaders but not city-specific industry leaders have higher audit risk (*CATA*), higher liquidity risk (*QUICK*), lower leverage (*DE*), and higher initial audit engagements (*INITIAL*). The remaining variables (*OPINION* and *BUSY*) are comparable across the specialty auditor groups.

[INSERT TABLE 3 HERE]

Table 4 presents the Pearson correlation matrix for all the variables examined in the study. The variable *LTA* is highly correlated to *LAF* at 0.9034, which is expected as client size represents the

main determinant of audit fees (Hay, Knechel, & Wong, 2006). Other than the above-mentioned variables, there is no other correlation of 0.70 and above identified in the matrix.

[INSERT TABLE 4 HERE]

#### 4. Results and discussion

Table 5 presents the results of various OLS regressions. Except for *DE*, *OPINION*, and *LOSS*, all control variables (*LNAF*, *LTA*, *SQRTSUBS*, *ROA*, *FOREIGN*, *QUICK*, *CATA*, *LONDON*, *BUSY*, and *INITIAL*) are significant at conventional levels and in the expected direction across all models examined.

Using the national-city framework of auditor specialization, Model 1 tests the joint effect of the firm national and city-specific industry leadership on UK audit fees. We use three auditor interactive and indicator variables as described earlier, i.e. Big 4 auditors that are jointly national and city-specific industry leaders; Big 4 auditors that are city-specific industry leaders but are not national industry leaders; and Big 4 auditors that are national industry leaders but are not city-specific industry leaders. The default comparison group is Big 4 auditors that are neither national nor city-specific industry leaders. The results of Model 1 in Table 5 show that neither national industry leadership alone nor city-specific industry leadership alone results in a fee premium, as coefficients for *CITYONLY* and *NATONLY* are not significant at conventional levels ( $p > 0.10$ ). Instead, a fee premium for industry leadership is earned only by the city-specific industry leaders if and when they are also national industry leaders (*JOINT*). The coefficient *JOINT* for the joint national and city-specific industry leadership is 0.089 ( $p < 0.01$ ), which represents a fee premium of 9.31 percent.

This finding of the *JOINT* auditors earning a fee premium is consistent with a recent UK evidence in Mohd Kharuddin and Basioudis (2018), who also reported significant industry specialist premiums for the joint leaders (averages at 7.14 percent), without any fee premium reported for either the national alone or city-specific alone. Our result further supports the argument that the premium for industry leadership in the UK is no longer driven by office level industry expertise. In terms of knowledge sharing, this finding suggests that there is some knowledge sharing and transferability of industry expertise between UK audit offices, as being an industry leader at the city level alone or

national level alone is not a sufficient condition for the Big 4 firm industry specialists to earn a fee premium.

In Model 2 of Table 5, we test the effect of partner industry leadership on audit pricing alone, without controlling for the joint effect of the firm's national and city industry leadership. The model uses 183 observations in which the Big 4 partner is the top-ranked industry leader, compared with the remaining 497 observations audited by non-specialist partners. The coefficient value for *PARTNER* is 0.076 and highly significant ( $p < 0.01$ ), which equates to an average audit fee premium of 7.9 percent.

Model 3 combines both the effect of audit partner and audit firm industry leadership at the national and city industry level, and tests them simultaneously to determine which type of industry leadership is more important (audit firm versus audit partner), and which yields the highest fee premium. This model also clarifies whether industry expertise at the partner level is independently associated with fee premium, or whether expertise at the firm, office, and partner levels jointly affect audit pricing in the UK market.

With Model 3 (see results in Table 5), we find that the fee premium for firm *JOINT* leaders is reduced slightly from that reported in Model 1 (coefficient for *JOINT*=0.057 at  $p < 0.01$ ) after controlling for the effect of partner industry expertise. We also find that audit firms that are city-specific industry leaders alone offer a fee discount (coefficient for *CITYONLY*= -0.051 at  $p < 0.10$ ). The *PARTNER* variable in Model 3 is highly significant and shows a similar coefficient to Model 2 (0.079,  $p < 0.01$ ). It is important to note here that the magnitude of the fee premium reported for partner industry leadership (*PARTNER*) in Model 3 of 0.079 is larger than that of 0.057 for *JOINT*, both at less than the one percent significant level. This suggests that the industry leadership premium is mainly attached to individual partner expertise rather than homogenously distributed among partners within a city office. In addition, and consistent with Mohd Kharuddin and Basioudis (2018), a fee discount is documented for audit firms that are city-specific industry leaders alone and do not possess national expertise. Such result may be an attempt by those city leaders to gain joint leadership by offering fee discounts and capturing new clients.

In untabulated results, we adopt an approach similar to Goodwin and Wu's (2014) by introducing various combination variables to concurrently capture the effect of firm and partner



industry leadership. The fee premium is the highest when both the firm and the partner are the industry leaders at both national and city levels. There is also evidence of fee premiums for the firm joint national and city industry leadership in the absence of partner industry leadership. A specialist partner operating in a specialist office that is not the national leader earns a fee premium, but it is smaller than for the specialist partner who operates in an office that is jointly the national and city industry leader. These results suggest that partner industry leadership is an important condition for a higher fee premium, but not a necessary condition.

Our results are contrary to those reported in recent studies in Australia and the US. Goodwin and Wu (2014) use Australian data to report evidence of premiums only for companies audited by partners who are industry leaders at the city level, suggesting that partner level expertise is the driver of the audit fee premium for industry expertise in Australia. Their results show no auditor industry expertise fee premium at the audit office level after controlling for partner level expertise. This is contrary to our findings using UK data, which report a fee premium for partners only if they are residing in an audit firm who is also a city-industry leader.

Nagy (2014) found evidence using US data to suggest that auditor specialization at both the partner and office levels are associated with a fee premium, but there is no significant difference between partner and office level specialization effects in regards to fee premiums. The US findings by Nagy (2014) are also not consistent with the UK results, as we find no evidence of fee premiums for clients of audit firms who are only city-industry leaders when the partner is not a leading industry specialist.

[INSERT TABLE 5 HERE]

## **5. Sensitivity to alternative measures of auditor industry leadership**

Many researchers recognize that the results are sensitive to the industry specialization measures used (Craswell et al., 1995; Ferguson & Stokes, 2002; Huang et al., 2007; Basioudis & Francis, 2007; Causholli et al., 2010; Hay & Jeter, 2011; Audousset-Coulier, Jeny, & Jiang, 2016).

Therefore, a range of sensitivity tests are performed using different measures of industry specialization in order to validate the results (Audoussert-Coulier et al., 2016).

### 5.1 Ten percent market share cut-off

Following Mayhew and Wilkins (2003), we redefined the top leaders in each industry using a ten percent market share cut-off measure (at the national, city, and partner level), and then rerun the regressions presented in Table 5. The ten percent market share cut-off ensures that there is adequate market dominance or sufficiently larger market share for the top-ranked industry leader relative to the second-ranked industry leader in a particular industry either at the national, city, or partner level. The results for Model 1, Model 2, and Model 3 re-estimations using the ten percent market share cut-off (untabulated) are comparable to the main findings in Table 5. For Model 3, the fee premium reported for the partner industry leadership (*PARTNER*) of 0.059 ( $p < 0.05$ , two-tail) is smaller than that of 0.074 ( $p < 0.01$ , two-tail) for *JOINT*. Also, a fee discount is reported for *CITYONLY* (coefficient - 0.058,  $p < 0.05$ , two-tail). The stricter definition of ten percent market share difference appears to have a small impact on the main results, but ultimately do not change our overall conclusions. The findings from the main analysis in Table 5 are robust to this alternative market share cut-off.

### 5.2 Continuous market share measure

Next, we test whether the main results presented in Table 5 are robust to the use of continuous market share measures of auditor industry leadership. When the audit fee regression is re-estimated using the firm national industry leader and city-specific industry leader continuous variables (in Model 1), a significant premium is reported only at the national level (coefficient = 0.120) at  $p < 0.01$ , whereas the coefficient for city-specific industry leader is insignificant at  $p = 0.10$ . This shows that national level industry leadership of the audit firm is more important than office-level expertise in explaining fee premiums. On the other hand, when the audit fee regression is estimated using the audit partner variable based on continuous market shares in Model 2, the partner variable is positive and significant (coefficient = 0.094,  $p < 0.05$ ). Finally, in Model 3, when the firm and partner industry leadership are analyzed in a single model, only the coefficients for both the firm national industry

leader (coefficient = 0.152, significant at  $p < 0.01$ ) and the partner industry leader (coefficient= 0.114, significant at  $p < 0.05$ ) are significant. Results from Model 3 suggest that both the firm and partner reputation matter in influencing the fee premium in the UK audit market, and are consistent with our results reported in section 4.

### 5.3 Alternative industry classification scheme

We check in this section whether our results are robust across a different industry classification scheme. Following Basioudis and Francis (2007), we reclassified our total sample based on the 25 two-digit SIC codes of LSE. We re-ran the tests in Table 5 and obtain qualitatively similar results.<sup>6</sup> Specifically, untabulated results in Model 3, the model of interest, reveal that the fee premium reported for the partner industry leadership (*PARTNER*) is 0.079 ( $p < 0.01$ , two-tail), which is larger than the *JOINT* premium of 0.057 ( $p < 0.05$ , two-tail). Also, consistent with the main findings, a weak fee discount is reported for *CITYONLY* (coefficient = -0.056,  $p < 0.10$ , one-tail). Thus, we conclude that the findings from the main analysis are robust to this alternative industry classification scheme.

### 5.4 Client size effect

To examine the Big 4 industry leadership premium based on client size, we follow Francis et al. (2005) by splitting our final sample by client size into two equal sub-samples ( $N=340$  each). The split is based on the median value of total assets (Great Britain Pound (GBP) £372.123 million).

After re-estimating Model 3, we find evidence of a significant fee premium only in the large client segment. Specifically, the fee premium reported for the partner industry leadership (*PARTNER*) of 0.171 ( $p < 0.01$ , two-tail) is larger than that of 0.042 ( $p < 0.10$ , one-tail) for *JOINT*. Also, consistent with the main findings in Table 5, a fee discount is reported for *CITYONLY*

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<sup>6</sup> Under the two-digit SIC Codes industry classification, the number of observations drops by 109 to 571 due to the fact that we impose a minimum restriction of two observations per each city-specific industry combination. Based on the 25 two-digit SIC industry codes of the LSE, there are more city-industry combinations relative to only the eight major industry classification scheme used in the main analysis reported in Table 4.

(coefficient = -0.108,  $p < 0.05$ , two-tail). Nevertheless, in the small client segment, no industry specialist variables are significant at any conventional level.

### 5.5 Partner gender and partner tenure

Motivated by Ittonen and Vahamaa (2012), who found that female audit engagement partners charge higher audit fees, we create an interaction term (*PARTNERFEM*) which combines the effect of the partner industry specialist variable (*PARTNER*) and a female audit partner variable (*FEMALE*). Interestingly, we find (results untabulated) that the *PARTNERFEM* coefficient is positive (0.145) and significant at  $p < 0.10$  (two-tail). This reported fee premium is even higher than reported in Model 3 of Table 5, where the *PARTNER* coefficient is only 0.079 (at  $p < 0.01$ , two-tail). This suggests that the female gender of an industry specialist partner moderates the relationship between partner industry specialist and audit fees.

In addition, Gul, Wu, and Yang (2013) and Bedard and Johnstone (2010) argue that partners are likely to build up their reputation and expertise with tenure. Thus, we create an interaction term (*PARTNERTEN*) which combines the effect of the partner industry specialist variable (*PARTNER*) and the partner tenure variable (*TENURE*).<sup>7</sup> The results (untabulated) indicate that the *PARTNERTEN* coefficient is not significant at any conventional level (coefficient = 0.020,  $p > 0.10$ , two-tail). This is probably because the partner tenure period measurement is too short (2009 to 2011) to have any impact on the audit price. This initial result from the UK is inconsistent with other studies on audit partner tenure in the US (Gul et al., 2013, Bedard & Johnstone, 2010). In comparison to prior studies, Goodwin and Wu (2014) found that the fee premium for partner industry specialist is not moderated by either the gender or the tenure of the audit partner, as they failed to find any significant result.

### 5.6 Matching the clients of specialist and non-specialist auditors

Minutti-Meza (2013) argues that his reported industry specialization premium using an OLS regression disappears after controlling for differences in client characteristics between the two auditor

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<sup>7</sup> *TENURE* represents a continuous variable in the regression that takes the value between 1 and 3 years. As the period of examination is 2009-2011, this means the tenure of a partner in the sample is capped at 3 years only.

groups by matching clients of specialist and non-specialist auditors. This led him to conclude that an auditor's within-industry market share is not a reliable indicator of audit quality. Thus, in this part of our paper, we refine the main test of the study and examine whether there is a consistent evidence of a specialist fee premium when a matched-pair analysis is used.

In order to re-estimate Model 1 in Table 5 using the matched-pair analysis, we first match the 209 companies that are audited by the Big 4 joint national and city-specific industry leaders (*JOINT*) with companies that are audited by Big 4 non-joint leaders based on size (net sales and/or total assets), major industry, and year, in the order mentioned. When Model 1 is re-estimated using the matched-pair analysis, the results (untabulated) show that the magnitude of *JOINT* variable is 0.103 and significantly associated ( $p < 0.01$ , two-tail) with audit pricing. Next, we perform the same procedure to re-estimate Model 2 using the same matching methodology as above, and match the 183 companies audited by partner industry leaders (*PARTNER*) with companies audited by non-leaders again based on size (net sales and/or total assets), major industry, and year, in the order mentioned. When Model 2 is re-estimated using the above matched-pair analysis, the results (untabulated) present a significant and positive relationship (coefficient = 0.088,  $p < 0.01$ , two-tail) between *PARTNER* and audit pricing.

Taken together, using the approach described by Minutti-Meza (2013), the reported (untabulated) results for both Model 1 and Model 2 under the matched-sample analyses are consistent with the main findings reported in Table 5 using OLS regression. These findings reaffirm our evidence of fee premium for the *JOINT* and *PARTNER* variables. However, in contrast to Minutti-Meza (2013), these two methodological approaches produce similar results, and therefore, yield the same conclusion in our study.

### 5.7 Market share based on clients' total assets and total sales

We test whether the main findings are sensitive to the use of audit fees to measure auditor market shares and industry leadership. The market shares of audit firms are recalculated based on the clients' total assets and on clients' total sales. Similar to the prior UK study by Mohd Kharuddin and Basioudis (2018), the untabulated results provide evidence of fee premiums for the joint national and

city-specific industry leaders, and fee discounts are reported for the city-specific industry leaders alone ( $p < 0.01$ ). The fee premiums for the joint leaders based on the clients' total assets and on clients' total sales are lower than the fee premium for *JOINT* reported in Model 1 of Table 5, possibly because the discount offered by the city-specific industry leaders alone offsets the higher fee premium charged by the joint leaders.

When we re-estimate Model 2 using clients assets and client sales in separate models to measure partner industry leadership, we find no significant fee premium attached to partner industry specialization (at  $p > 0.10$ ). When we re-estimate Model 3, the results from using clients' assets and clients' sales contradict each other. Model 2 and Model 3 examine partner specialization, and it is evidenced that partner specialization may not be captured well by measures of client total assets or client sales. This is consistent with earlier UK studies by Basioudis and Francis (2007) and Mohd Kharuddin and Basioudis (2018), where similar incongruous results between specialization based on audit fees versus specialization based on client total assets and client sales were recorded.

We infer that the results in Table 5 that use audit fees to measure industry leadership are not robust to alternative definitions of industry market share leadership based on either assets of clients or the sales of clients. An explanation for the lack of significance here is that the measures of specialization using assets or sales are not reliable measures of auditor specialization. Audoussert-Coulier et al. (2016, p. 158) conclude that such size-based measures "failed to act as valid surrogates" for specialization.

## 6. Conclusion and Limitation

This study is motivated by the issue of differentiating auditor quality and the opportunity provided by the mandatory requirement for the disclosure of the engagement partner's name in the auditor's report in the UK. This requirement provides an opportunity to investigate whether audit industry expertise is driven by firm, office, or partner level expertise, or some combination of them.

The results suggest that the fee premium attached to auditor industry expertise is a joint product of industry expertise at both the firm (national) and partner levels. The fee premium is highest when the client is also audited by the leading industry partner. It can be inferred that partner industry

leadership is an important condition, but not a necessary condition for a fee premium. This partly supports the argument that industry expertise is uniquely attributable to the individual audit partner human capital in terms of their knowledge and experience from leading audit engagements in a particular industry. Expertise also captured at the firm national level remains an important aspect in generating fee premiums<sup>8</sup>. Our findings are generally robust to alternative measures of industry leadership as presented in the additional analysis section.

This study uses data from 2009 to 2011 as this was the immediate period after which audit partner names were first disclosed in the UK. We are capturing the immediate and direct specialization effects of the newly available partner data available after this new regulation, and as such, the first three years of disclosure provide sufficient information for adequate conclusions to be reached. Nevertheless, we acknowledge that this time period can be regarded as a limitation of the study, and we encourage other researchers to extend the study using more recent data.

This study informs practitioners whether it is economically important for the individual auditor to invest in industry specialization and build a reputation as an industry expert. It is also applicable to whether the audit firm would need to develop a more effective mechanism to facilitate knowledge transfer between all its partners so that the audit firm could create a broader reputation for industry expertise. Our results are also of interest to international regulators and standard setters in gaining better understanding of the drivers of audit quality and to what extent the firm, office, and/or partner level industry expertise may affect audit quality. It is relevant to the implications of the disclosure of the identity of engagement partners in the auditor's report.

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<sup>8</sup> We take note that the higher audit fee for specialised partners demonstrated here could be due to several explanations. First, it could be a true price premium (with engagement effort similar). This might suggest that the auditor will be less independent in order to retain the high-margin engagement, and audit quality could be reduced. Or it could be that greater engagement effort is recognized as needed by the specialist partner. Without separate data on engagement hours and billing rates, we are unable to tell. Thus, this represents a limitation to our study. The inability to determine whether incremental fees are due to hours or rates is common to all audit fee studies using publicly available data.

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TABLE 1

## Selection Procedures for the Final Sample

All LSE listed companies in 2009-2011	7,222
Less: Companies not followed by FAME database (mainly, small and dormant)	(4,065)
Less: Financial firms, public administration and defence, health and education, other services firms	(1,651)
Less: Firms with incomplete data	<u>(171)</u>
<b>Full sample with complete data</b>	<b>1,335</b>
Less: Non-Big 4 sample	<u>(439)</u>
Full Big 4 sample	896
Less: Sample with less than two observations per city-industry combination	<u>(216)</u>
<b>Final sample</b>	<b>680</b>

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**TABLE 2**  
**Definition of Variables**

Variable	Definition
<b>DEPENDENT VARIABLE</b>	
<i>LAF</i>	natural log of audit fees in GBP'000
<b>SPECIFICATION FOR INDUSTRY SPECIALIST AUDITOR (<i>AUDITOR</i>) VARIABLES</b>	
<i>JOINT</i>	indicator variable, = 1 if the audit firm is the top-ranked by market share nationally and the audit office is the top-ranked by city-industry market share, 0 if otherwise
<i>CITY_ONLY</i>	indicator variable, = 1 if the audit firm is not the top-ranked by market share nationally and the audit office is the top-ranked by city-industry market share, 0 if otherwise
<i>NAT_ONLY</i>	indicator variable, = 1 if the audit firm is the top-ranked by market share nationally and the audit office is not the top-ranked by city-industry market share, 0 if otherwise
<i>PARTNER</i>	indicator variable, = 1 if the audit partner is the top-ranked by city-industry market share, 0 if otherwise
<b>CONTROL VARIABLES</b>	
<i>LNAF</i>	natural log of non-audit fees (in GBP'000) paid to the incumbent auditor
<i>LTA</i>	natural log of total assets in GBP'000
<i>SQRTSUBS</i>	square root of total subsidiaries
<i>ROI</i>	ratio of earnings before interest and tax to total assets
<i>DE</i>	ratio of long-term debt to total assets
<i>FOREIGN</i>	proportion of total sales from foreign operations
<i>QUICK</i>	ratio of current assets (less inventories) to current liabilities
<i>CATA</i>	ratio of current assets to total assets
<i>OPINION</i>	indicator variable, 1 = qualified or going concern audit report; 0 = otherwise
<i>LONDON</i>	indicator variable, 1 = London-based company, 0 = otherwise
<i>BUSY</i>	indicator variable, 1 = December 31st or March 31st year-end, 0 = otherwise
<i>LOSS</i>	indicator variable, 1 = loss in any of the past three years, 0 = otherwise
<i>INITIAL</i>	indicator variable, 1 = new auditor in the current or prior year, 0 = otherwise
$\varepsilon$	error term

**TABLE 3**  
**Descriptive Statistics**

Panel A:	Full Sample (N = 680)				
	Mean	Median	Std.	Q1	Q3
<i>LAF</i>	5.510	5.435	0.615	5.050	5.900
<i>LNAF</i>	4.928	5.205	1.477	4.720	5.713
<i>LTA</i>	8.629	8.570	0.917	7.960	9.313
<i>SQRTSUBS</i>	3.459	3.160	1.755	2.240	4.690
<i>CATA</i>	0.430	0.410	0.232	0.250	0.583
<i>QUICK</i>	1.802	0.950	3.539	0.630	1.470
<i>DE</i>	0.143	0.100	0.153	0.000	0.240
<i>ROI</i>	0.023	0.050	0.185	0.000	0.100
<i>FOREIGN</i>	0.361	0.120	0.406	0.000	0.840
<i>OPINION</i>	0.051	0.000	0.221	0.000	0.000
<i>BUSY</i>	0.651	1.000	0.477	0.000	1.000
<i>LOSS</i>	0.212	0.000	0.409	0.000	0.000
<i>LONDON</i>	0.403	0.000	0.491	0.000	1.000
<i>INITIAL</i>	0.131	0.000	0.338	0.000	0.000

Refer to Table 2 for definition of variables.

**TABLE 3 (Continued)**  
**Descriptive Statistics**

Panel B:	Big 4 Partner Industry Leader Sample (N = 183)		Big 4 Non-Leader Sample (N = 497)		Mean Difference	
	Mean	Std. Dev.	Mean	Std. Dev.	T-test	p-value
<i>LAF</i>	5.625	0.712	5.468	0.570	-2.981	0.003
<i>LNAF</i>	5.052	1.465	4.883	1.480	-1.3241	0.186
<i>LTA</i>	8.757	1.018	8.582	0.873	-2.214	0.027
<i>SQRTSUBS</i>	3.629	1.875	3.397	1.707	-1.5309	0.126
<i>CATA</i>	0.435	0.212	0.428	0.240	-0.357	0.721
<i>QUICK</i>	1.372	1.891	1.961	3.967	1.930	0.054
<i>DE</i>	0.155	0.156	0.138	0.151	-1.281	0.201
<i>ROI</i>	0.033	0.151	0.019	0.197	-0.877	0.381
<i>FOREIGN</i>	0.348	0.397	0.366	0.410	0.561	0.613
<i>OPINION</i>	0.055	0.228	0.050	0.219	-0.227	0.821
<i>BUSY</i>	0.705	0.457	0.632	0.483	-1.776	0.076
<i>LOSS</i>	0.186	0.390	0.221	0.416	1.005	0.315
<i>LONDON</i>	0.257	0.438	0.457	0.499	4.786	0.000
<i>INITIAL</i>	0.098	0.299	0.143	0.350	1.526	0.127

Panel C:	Big4 Joint National and City-Specific Industry Leader Sample (N = 209)		Big4 Non-Leader Sample (N = 471)		Mean Difference	
	Mean	Std. Dev.	Mean	Std. Dev.	T-test	p-value
<i>LAF</i>	5.745	0.689	5.406	0.549	-6.848	0.000
<i>LNAF</i>	5.104	1.636	4.850	1.395	-2.070	0.039
<i>LTA</i>	8.948	0.941	8.488	0.870	-6.205	0.000
<i>SQRTSUBS</i>	3.675	1.807	3.364	1.726	-2.143	0.033
<i>CATA</i>	0.396	0.208	0.445	0.241	2.524	0.012
<i>QUICK</i>	1.504	3.170	1.935	3.686	1.465	0.143
<i>DE</i>	0.151	0.140	0.139	0.158	-0.931	0.352
<i>ROI</i>	0.055	0.125	0.009	0.205	-2.967	0.003
<i>FOREIGN</i>	0.385	0.417	0.350	0.401	-1.047	0.296
<i>OPINION</i>	0.053	0.224	0.051	0.220	-0.091	0.927
<i>BUSY</i>	0.679	0.468	0.639	0.481	-1.018	0.309
<i>LOSS</i>	0.172	0.379	0.229	0.421	1.681	0.093
<i>LONDON</i>	0.402	0.491	0.403	0.491	0.036	0.971
<i>INITIAL</i>	0.077	0.267	0.155	0.362	2.810	0.005

Refer to Table 2 for definition of variables.

TABLE 3 (Continued)

## Descriptive Statistics

Panel D:	Big4 City-Specific Industry Leader Only Sample (N = 104)		Big4 Non-Leader Sample (N = 576)		Mean Difference	
	Mean	Std. Dev.	Mean	Std. Dev.	T-test	p-value
<i>LAF</i>	5.252	0.506	5.557	0.622	4.720	0.000
<i>LNAF</i>	4.561	1.515	4.995	1.461	2.771	0.006
<i>LTA</i>	8.275	0.903	8.693	0.905	4.343	0.000
<i>SQRTSUBS</i>	3.161	1.743	3.513	1.754	1.885	0.060
<i>CATA</i>	0.469	0.236	0.422	0.231	-1.901	0.058
<i>QUICK</i>	1.557	2.375	1.847	3.710	1.885	0.060
<i>DE</i>	0.156	0.172	0.140	0.149	-0.933	0.351
<i>ROI</i>	-0.040	0.252	0.034	0.168	3.782	0.000
<i>FOREIGN</i>	0.249	0.332	0.381	0.415	3.070	0.002
<i>OPINION</i>	0.067	0.252	0.049	0.215	-0.793	0.428
<i>BUSY</i>	0.692	0.464	0.644	0.479	-0.945	0.343
<i>LOSS</i>	0.240	0.429	0.207	0.405	-0.775	0.438
<i>LONDON</i>	0.221	0.417	0.436	0.496	4.153	0.000
<i>INITIAL</i>	0.144	0.353	0.128	0.335	-0.439	0.662
Panel E:	Big4 National Industry Leader Only Sample (N = 36)		Big4 Non-Leader Sample (N = 664)		Mean Difference	
	Mean	Std. Dev.	Mean	Std. Dev.	T-test	p-value
<i>LAF</i>	5.124	0.439	5.532	0.617	3.913	0.000
<i>LNAF</i>	4.604	1.547	4.946	1.472	1.355	0.176
<i>LTA</i>	8.003	0.690	8.664	0.916	4.268	0.000
<i>SQRTSUBS</i>	3.329	1.530	3.467	1.768	0.457	0.648
<i>CATA</i>	0.487	0.251	0.426	0.231	-1.515	0.130
<i>QUICK</i>	1.663	3.598	1.810	3.538	0.243	0.809
<i>DE</i>	0.119	0.158	0.144	0.152	0.937	0.336
<i>ROI</i>	0.003	0.210	0.024	0.184	0.674	0.501
<i>FOREIGN</i>	0.239	0.356	0.368	0.408	1.861	0.063
<i>OPINION</i>	0.056	0.232	0.051	0.221	-0.114	0.910
<i>BUSY</i>	0.583	0.500	0.655	0.476	0.881	0.379
<i>LOSS</i>	0.250	0.439	0.210	0.407	-0.576	0.565
<i>LONDON</i>	0.222	0.422	0.413	0.493	2.277	0.023
<i>INITIAL</i>	0.167	0.378	0.129	0.335	-0.653	0.514

Refer to Table 2 for definition of variables.



TABLE 4

## Pearson Correlation Matrix

	A	B	C	D	E	F	G	H	I	J	K	L
A	1											
B	0.5444*	1										
C	0.9034*	0.5049*	1									
D	0.6213*	0.3299*	0.5429*	1								
E	0.3368*	0.2191*	0.4284*	0.2397*	1							
F	0.3704*	0.1819*	0.4332*	0.1936*	0.1279*	1						
G	0.1853*	0.1191*	0.0938*	0.1245*	0.0605*	0.0258	1					
H	-0.2940*	-0.1899*	-0.2459*	-0.2132*	-0.1930*	-0.2355*	-0.0872*	1				
I	-0.1747*	0.0003	-0.2544*	-0.0405*	-0.0621*	-0.3733*	-0.0679*	0.2129*	1			
J	-0.1862*	-0.1774*	-0.2376*	-0.1478*	-0.2989*	-0.0888*	-0.0133	0.0286	-0.1102*	1		
K	0.0171	-0.0434*	-0.0305	-0.0704*	-0.0990*	-0.0632*	0.1371*	0.1209*	-0.1325*	0.0866*	1	
L	0.1202*	0.0869*	0.0710*	0.0625*	-0.0368	-0.0652*	0.1164*	0.0583*	-0.0388	0.0431*	0.1564*	1
M	-0.3241*	-0.2087*	-0.3782*	-0.2313*	-0.4853*	-0.1421*	0.0133	0.2567*	0.0049	0.2295*	0.1560*	0.0464*
N	-0.1975*	-0.1920*	-0.1741*	-0.1057*	-0.0796*	-0.0553*	-0.0668*	0.0558*	-0.0351	0.0530*	-0.0433*	-0.0347
O	0.3908*	0.1997*	0.3849*	0.1947*	0.1613*	0.1628*	0.0166	-0.1062*	-0.0888*	-0.0541*	-0.0776*	0.0285
P	0.0416	0.0714*	0.0523*	0.0696*	-0.0029	0.0936*	-0.0356	-0.0669*	0.0466*	-0.0342	-0.1606*	0.0213
Q	-0.0185	0.0353	-0.0183	0.0474*	0.0264	0.0037	-0.0586*	-0.0328	0.0311	-0.0066	-0.0940*	-0.0269
R	0.2900*	0.1884*	0.2716*	0.1804*	0.1182*	0.1449*	0.0146	-0.1148*	-0.0059	-0.0508*	-0.2036*	0.0515*

Refer to Table 2 for definition of variables.

TABLE 4 (Continued)

## Correlation Matrix

	M	N	O	P	Q	R
M <i>LOSS</i>	1					
N <i>INITIAL</i>	0.0820*	1				
O <i>JOINT</i>	-0.1438*	-0.1165*	1			
P <i>CITYONLY</i>	-0.0352	-0.0383	-0.1603*	1		
Q <i>NATONLY</i>	-0.0182	0.0084	-0.0901*	-0.0595*	1	
R <i>PARTNER</i>	-0.1130*	-0.0686*	0.3723*	0.5104*	-0.0865*	1

Refer to Table 2 for definition of variables.

**TABLE 5**  
**Regression Results for the Audit Fee Models**

	Predicted	Model 1			Model 2			Model 3		
		Coef.	t-stat	p-value	Coef.	t-stat	p-value	Coef.	t-stat	p-value
Constant		0.637	5.420	0.000	0.603	5.330	0.000	0.675	5.910	0.000
<i>JOINT</i> (N=209)	+	<b>0.089</b>	<b>4.530</b>	<b>0.000</b>				<b>0.057</b>	<b>2.830</b>	<b>0.005</b>
<i>CITYONLY</i> (N=104)	+	0.006	0.220	0.827				<b>-0.051</b>	<b>-1.770</b>	<b>0.078</b>
<i>NATONLY</i> (N=36)	+	0.013	0.310	0.755				0.013	0.320	0.746
<i>PARTNER</i> (N=183)	+				<b>0.076</b>	<b>3.660</b>	<b>0.000</b>	<b>0.079</b>	<b>3.470</b>	<b>0.001</b>
<b><u>Control variables</u></b>										
<i>LNAF</i>	+	0.042	5.010	0.000	0.041	4.850	0.000	0.041	4.910	0.000
<i>LTA</i>	+	0.494	31.890	0.000	0.500	33.390	0.000	0.490	32.760	0.000
<i>SQRTSUBS</i>	+	0.067	10.400	0.000	0.067	10.650	0.000	0.067	10.590	0.000
<i>ROI</i>	-	-0.135	-2.550	0.011	-0.127	-2.340	0.020	-0.142	-2.690	0.007
<i>DE</i>	+	-0.119	-1.630	0.103	-0.155	-2.160	0.031	-0.121	-1.680	0.093
<i>FOREIGN</i>	+	0.167	6.470	0.000	0.169	6.460	0.000	0.166	6.410	0.000
<i>QUICK</i>	-	-0.009	-3.270	0.001	-0.009	-2.970	0.003	-0.009	-3.190	0.001
<i>CATA</i>	+	0.109	2.080	0.038	0.092	1.780	0.075	0.100	1.950	0.051
<i>OPINION</i>	+	0.064	1.210	0.226	0.070	1.360	0.173	0.063	1.190	0.233
<i>LONDON</i>	+	0.090	4.840	0.000	0.101	5.370	0.000	0.098	5.280	0.000
<i>BUSY</i>	+	0.062	3.350	0.001	0.060	3.260	0.001	0.060	3.310	0.001
<i>LOSS</i>	+	0.026	0.930	0.354	0.031	1.110	0.268	0.024	0.860	0.392
<i>INITIAL</i>	-	-0.104	-3.770	0.000	-0.108	-3.930	0.000	-0.104	-3.750	0.000
Year Fixed-Effects			Yes			Yes			Yes	
Industry Fixed-Effects			Yes			Yes			Yes	
$R^2$			0.880			0.879			0.882	
$N$			680			680			680	

<sup>a</sup> All  $p$ -values are two-tailed. Industry fixed-effects and year fixed-effects are not reported for brevity, and t-statistics and significance levels are calculated using the White (1980) robust standard errors to correct for heteroscedasticity.

<sup>b</sup> The sample comprises 680 observations of UK public listed companies that are audited by Big 4 auditors. The sample size is derived after deleting 216 observations with less than two city-specific observations per industry from the Big 4 sample ( $N = 896$  as reported in Table 1). This additional screening is performed as to ensure that the audit market for the all the cities in specific industries analyzed is competitive where more than one audit client exists.

The dependent variable is LAF, the natural log of audit fees in GBP'000.

Refer to Table 2 for definition of variables.