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Personal Knowledge of Audit Partners and Organizational Knowledge of Audit
Firms and the Impact on Audit Fees

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Abstract: This study develops a conceptual framework for auditor knowledge comprising both the personal knowledge of auditors and the organizational knowledge of audit firms. We use this to examine how three measures of the personal knowledge held by engagement audit partners—the depth and width of knowledge and industry expertise—impact upon audit fees. We find that an engagement partner with deeper knowledge provides audit services more efficiently. In addition, audit fees are negatively associated with partners' wider knowledge and positively with partners' industry expertise, but only for audits by Big 4 audit firms.

Keywords: Personal knowledge, Organizational knowledge, Industry expertise, Engagement partners

Data Availability: The data used are from publicly available sources.

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INTRODUCTION

The purpose of this study is to develop a conceptual framework for auditor knowledge (or expertise), propose several proxies for measuring auditor knowledge at the personal level, and preliminarily examine whether these proxies affect the level of audit fees. Although some experimental studies directly measure or manipulate the content or structure of personal knowledge and examine its effects on auditors' judgment and decision making (e.g., Nelson et al., 1995; Thibodeau, 2003), almost all archival studies that explore the industry expertise of auditors adopt a measure based on market share at the firm or office level. However, given that the audit market is currently dominated by the Big 4 audit firms, it is doubtful that this approach appropriately captures auditor industry expertise.

To address this, this study develops a conceptual framework for auditor knowledge comprising personal- and organizational-level knowledge. The former type of knowledge is unique to each auditor and is obtained through such means as audit experience, in-house training, quality control at the firm level, and the supervision and direction in an audit team. The latter form of knowledge accumulates in an audit firm through the review of audit processes and results in each audit team and the exercise of quality control, and it is explicitly reflected in firm documentation, including audit-related manuals.

It would appear that in practice, at least in the Japanese context, emphasis has traditionally been placed on personal knowledge over organizational knowledge. This is evidenced by the fact that the large audit firms in Japan were formed by mergers and

acquisitions in the 1980s or earlier (Karube and Fukukawa, 2012), and that most certified public accountants (CPAs) who worked for a now-defunct Big 4 firm (ChuoAoyama) moved to another audit firm and continued to provide audit services following the firm's 2006 demise (Fukukawa, 2011). If organizational knowledge were crucial to the conduct of a quality audit, many audit firms would have encountered difficulties after the wave of mergers and acquisitions and many CPAs could not have moved to another firm from ChuoAoyama following its demise. However, with the implementation of mandatory audit partner rotation in many developed countries (e.g., in Japan, every five years for large firms and seven years for other firms), organizational knowledge has become increasingly more important in recent years.

Prior archival research on auditor knowledge or expertise has generally failed to distinguish the personal knowledge of auditors from the organizational knowledge of their audit firm. Using our proposed conceptual framework for auditor knowledge, we focus on the personal knowledge of engagement partners, which we attempt to measure using archival data. Specifically, in Japanese practice, each engagement partner signs his/her name on the auditor's report. By using the information contained in this unique dataset, we can measure the depth of knowledge (i.e., how many years an engagement partner has continuously been involved with a particular client), the width of knowledge (i.e., how many clients the partner has served as an engagement partner in the current fiscal year), and industry expertise (i.e., to what extent the engagement partner has focused on a particular industry). We then measure firm-level knowledge using each firm's market share, and compare these knowledge aspects, both personal and organizational, across audit firms.

Finally, in a preliminary analysis, we examine whether personal knowledge impacts upon the level of audit fees. We find that the depth of the knowledge held by auditors negatively affect audit fees. We also find that audit fees are negatively affected by the width of the knowledge and positively by industry expertise, but only for audit partners in Big 4 audit firms. In addition, market-share-based organizational knowledge exerts a positive impact on audit fees, but only for non-Big 4 audit firms. Taken together, these findings suggest that an audit partner with deeper and wider knowledge provides audit services more efficiently, that partners with greater industry expertise charge a fee premium, and that Big 4 firms with sufficient industry expertise provide high-quality audits in any industry and are therefore unable to earn additional fees for incremental industry market share.

The remainder of the paper is organized as follows. The second section discusses the background to this study and describes the Japanese audit market. In the third section, we develop our conceptual framework for auditor knowledge and propose the three measures of personal knowledge held by auditors. The fourth section describes a preliminary analysis that involves regressing audit fees on these knowledge variables and presents the results of this analysis. The final section summarizes our conclusions and discusses some directions for future research.

BACKGROUND AND THE JAPANESE AUDIT MARKET

The importance of auditor knowledge (or expertise) for audit quality cannot be overemphasized. As a result, much research has already been devoted to investigating the effects of auditor knowledge on judgment and decision making (for a comprehensive review of the experimental research, see Bonner, 2008, Ch. 3). Most archival research has

considered the industry expertise of auditors based on the industry market shares of audit firms and its effect on audit fees. For example, Craswell et al. (1995) define industry specialist Big 8 audit firms as those with at least a 10% market share in the industry and find that audit fees for these firms are generally higher than those for non-specialist Big 8 firms. Moreover, many studies find that the fee premium resulting from industry specialization is higher for larger clients (Ferguson and Stokes, 2002; Ferguson et al., 2003; Carson and Fargher, 2007). In particular, Ferguson et al. (2003) conclude that the fee premium is attributable more to office-level specialization than to firm-level specialization. Elsewhere, Casterella et al. (2004) investigate the relationship between auditor industry specialization and client bargaining power and find no evidence of an audit fee premium for industry specialization when a client has strong bargaining power. Conversely, Mayhew and Wilkins (2003) find evidence of a negative association between audit fees and audit firm market share and a positive association between audit fees and audit firm differentiation (i.e., whether an audit firm has both the largest market share in the industry and a large market share lead over its closest competitor).

Importantly, although these studies use firm- or office-level market share as a measure of auditor industry specialization and generally find evidence of a positive relationship with audit fees, it is not clear whether market share remains valid as a proxy for the auditor industry expertise. To help clarify this point, we consider the current audit market in Japan as an example.

[TABLES 1 AND 2 ABOUT HERE]

Tables 1 and 2 provide information on the market shares of the Big 4, namely, ShinNihon (Ernst & Young), Tohmatsu (Deloitte), Azsa (KPMG), and Aarata (PricewaterhouseCoopers, PwC), and other audit firms in Japan in 2010 in terms of the number of clients and the level of audit fees, respectively. As shown, the audit market in Japan is clearly dominated by the Big 4 firms (i.e., 73.1% in terms of the number of clients and 86.8% in terms of audit fees).¹ It is also notable that the market shares of three of the Big 4 firms (ShinNihon, Azsa, and Aarata) are higher in terms of audit fees than in the number of clients. This implies that these particular firms generally have larger clients than do other firms.

The market share data in Tables 1 and 2 cast some doubt on the validity of a market-share-based measure of auditor industry specialization (or expertise). For example, by looking at the fiber product industry, which is a relatively small industry, we can see that ShinNihon has 13 clients (a client market share of 22.4%) and earns 973 million yen (a fee market share of 31.0%). Conversely, in the case of the trading industry, which includes 394 companies, Azsa has 73 clients and earns 5.7 billion yen in fees, implying a market share in this industry of 18.5% and 24.2%, respectively. Based on the market-share-based measure of industry specialization, we would consider that ShinNihon is more specialized in terms of the conduct of audit services in the fiber product industry than is Azsa in the trading industry, even though Azsa has many more clients and earns substantially more fees in that industry. The question is why 73 clients in a fairly large industry (in terms of the number of

¹ Aarata (PwC) had only 78 listed company clients in 2010 (or 2.2% of the total). ChuoAoyama, previously one of the Big 4 firms and formerly part of the PwC alliance, was dissolved in 2006 because of its involvement in a major accounting scandal. Following its demise, some former ChuoAoyama partners and PwC established Aarata, but it is still only about one-third the size of the other Big 4 firms. For more details about the demise of ChuoAoyama, see Fukukawa (2011).

companies) would be insufficient for Azsa to establish appropriate industry-specialized expertise. A similar question is whether having 108 clients in the same industry, as for Tohmatsu, necessarily leads to more specialized expertise than is possible for Azsa to achieve. Given the highly concentrated nature of the Japanese audit market, it would be reasonable to argue that market share is not an appropriate measure of either auditor specialization or expertise.

In addition, prior archival research has not distinguished between auditors' personal knowledge and firms' organizational knowledge, nor attempted to directly measure personal knowledge. For the most part, the market-share-based industry specialization measure used in extant studies is considered to adequately capture at least some aspects of audit firm organizational knowledge. However, as this is clearly unrelated to personal knowledge, we focus on the personal knowledge of auditors.

CONCEPTUAL FRAMEWORK AND KNOWLEDGE MEASURES

Figure 1 depicts the conceptual framework for auditor knowledge adopted in this study. As shown, auditor knowledge comprises the personal knowledge of auditors and the organizational knowledge of audit firms. Personal knowledge is gained through audit experience, along with in-house training such as continuous professional education, effective quality control by the firm, and the supervision/direction of a superior in an audit team (Arrow [1]). In contrast, as indicated by the direction of arrows [2] and [6], organizational knowledge is accumulated through feedback from the firm's constituents.²

² See, for example, Spender (1996) and Tsoukas and Vladimirou (2001).

In turn, there are two layers in the personal knowledge of auditors: (1) knowledge of a particular client and (2) knowledge of other companies and a particular industry. The first layer relates to the depth of knowledge, obtained through direct experience in auditing the client's financial statements. Generally, the longer an auditor is involved with a client, the greater the knowledge of the client gained. The second layer relates to knowledge obtained through auditing other companies and by concentrating on a smaller range of industries. Such knowledge can be useful to the auditor in auditing the client, as shown by arrow [3] in Figure 1, because it provides additional information for use in comparing the client with other companies in the same industry. As a rule, the more clients an auditor is involved with, the greater the knowledge of other companies obtained (width of knowledge). Likewise, if an auditor focuses on clients in fewer industries, he/she can develop deeper expertise in those industries.

Next, we examine how to measure the personal knowledge of auditors (i.e., depth of knowledge, width of knowledge, and industry expertise). As discussed, in Japan each engagement partner signs his or her name on the auditor's report. We collected data on all engagement partners for all listed companies during the period from 2004 to 2010 from the auditor reports included in the company annual reports, complemented by the *2012 Report on Auditor and Audit Fees of Publicly Listed Companies* (Study Group on Auditor and Audit Fee Issues, 2011).

Using this large dataset, we measure the personal knowledge of engagement partners and describe in detail whether and how such personal knowledge differs among Big 4 audit firms and between Big 4 and other audit firms. First, we can operationalize the depth of knowledge with the number of years an engagement partner has been involved with a

particular client. Table 3 details how many years the engagement partners in the 2010 audits have continuously provided audit services to the same client. In 2010, 2,397 engagement partners signed their name on 8,066 auditor's reports for a total of 3,585 listed companies. This means that on average each auditor's report was signed by 2.25 engagement partners.

[TABLE 3 ABOUT HERE]

On average, each engagement partner is involved with a particular client for 3.31 years, with a range of one to seven years.³ To examine whether there are any significant differences in the mean number of years for client involvement among audit firms, we conducted a multiple comparison test (Tukey test). The test result shows that the mean for Aarata (3.02 years) is significantly lower than those for ShinNihon (3.42 years) and Tohmatsu (3.48 years) (at the 10% and 5% level, respectively), while the mean for Others (2.99 years) is significantly lower than those for ShinNihon (3.42 years), Tohmatsu (3.48 years), and Azsa (3.38 years) (all at the 1% level).

To operationalize the width of knowledge, we use the number of clients with which a partner is involved in 2010. Table 4 presents the number of partners who provided audit services to a particular number of clients. For example, 82 partners in ShinNihon are involved with only one client. In total, about 60% of partners serve as an engagement partner for three or fewer clients and more than 90% of partners serve as an engagement partner for seven or fewer clients. Surprisingly, some partners provide audit services to more than 10 clients.

³ As the data period is 2004–2010, engagement partners who have been providing audit services to the same client for more than seven years are included in the seven-year category.

[TABLE 4 ABOUT HERE]

We also conduct a multiple comparison (Tukey test) to examine the differences between audit firms in the mean number of clients with which a partner is involved. We find that the mean number of clients for Tohmatsu (4.37 clients) is significantly higher than for the other Big 4 firms (at either the 1% or 5% level). Furthermore, the mean number of clients for Others (3.37 clients) is significantly lower than for all Big 4 firms (at the 1% level). This result indicates that in 2010 Big 4 partners were generally involved with more clients than partners in non-Big 4 firms and that Tohmatsu's partners usually serve more clients as an engagement partner than do partners in other Big 4 firms.

Table 5 details the numbers of industries with which partners were involved in providing audit services in 2010. We calculated these numbers by classifying the clients the partner serves as an engagement partner into the industry categories presented in Tables 1 and 2. Of the 2,397 partners, more than 50% are involved with only one or two industries. On average, a partner is involved with 2.74 industries, with a range from 1 to 12 industries.

[TABLE 5 ABOUT HERE]

The results of a multiple comparison test (Tukey test) show that the mean number of industries for ShinNihon (3.20) is significantly higher than those for Aarata (2.43) (at the 5% level) and Others (2.00) (at the 1% level). Likewise, the mean for Tohmatsu (3.36) is significantly higher than those for Azsa (3.06), Aarata (2.43), and Others (2.00) (at the 10%, 1% and 1% level, respectively) and the mean for Azsa is significantly higher than that for Others (at the 1% level). This result indicates that non-Big 4 partners are generally involved with fewer industries than are Big 4 auditors and that there are also some differences between

Big 4 firms. We consider that this reflects each firm's policy on partner assignment and the development of industry expertise.

Next, we define industry expertise as the number of clients a partner serves as an engagement partner minus the number of industries in which the clients operate plus one. In general, this measure of partner industry expertise takes a larger value when a partner serves more clients as an engagement partner and is involved with fewer industries. As shown in Table 6, the mean industry expertise score is 1.62 with a range of 1 to 17.

[TABLE 6 ABOUT HERE]

A comparison of the audit firms' mean scores (Tukey test) reveals that the mean for Tohmatsu (2.01) is significantly higher than those for ShinNihon (1.76), Azsa (1.62), and Others (1.33) (at the 1% level), while the mean for Others (1.33) is significantly lower than those for ShinNihon (1.76) and Azsa (1.62) (both at the 1% level). This indicates that Big 4 partners generally have greater industry expertise than non-Big 4 partners and that the level of industry expertise among Tohmatsu's partners is higher than that of other Big 4 firms.

In summary, our data indicate that Big 4 partners provide audit services to a particular client over a longer period, serve more clients as an engagement partner, are involved with more industries, and have a higher level of industry expertise than non-Big 4 partners. There are also some significant differences among the Big 4 firms in the personal knowledge of partners. Generally, Tohmatsu's partners provide audit services to a particular client over a longer period, have more clients, are involved with more industries, and have a higher level of industry expertise than partners in the other Big 4 firms. We consider that such differences among Big 4 firms reflect differences in their approaches to developing the personal

knowledge of their partners, the organizational knowledge of the firm, and the knowledge relationships between the partners and the firm.

The measures of personal knowledge detailed, i.e., (1) the depth of knowledge, defined as the number of years an engagement partner has consecutively served a particular client, (2) the width of knowledge, defined as the number of clients with which a partner is involved, and (3) industry expertise, calculated as the combination of the width of knowledge and the number of industries with which a partner is involved, capture important components in our conceptual framework described earlier (Figure 1), which is one of the main contributions of this study. It is also interesting to see the extent to which these aspects of auditor personal knowledge vary across audit firms.

PRELIMINARY ANALYSIS

Overview

Although we have proposed new measures of the personal knowledge of auditors that appear to be useful in capturing important aspects of knowledge and have provided detailed descriptive statistics of these same measures, it is unclear whether these measures are associated with audit quality overall or the quality of auditor judgment and decision making. Consequently, in a preliminary analysis, we examine whether the depth and width of knowledge and industry expertise as defined affect audit pricing. More specifically, we address the following two research questions in our analysis.

RQ1: How do the measures of the personal knowledge of engagement partners affect audit fees?

RQ2: Does the effect of the personal knowledge of engagement partners differ depending on whether they are auditors in Big 4 firms?

The first research question relates to the role of knowledge or expertise in determining audit fees. If a knowledgeable engagement partner provides a higher-quality audit to a client, audit fees will be higher. On the other hand, if the quality of audits is determined and controlled by the audit firm and is similar for all the firm's partners, audit fees for audits conducted by a knowledgeable partner will be lower because the partner can produce the given level of audit service more efficiently. However, it is not clear whether a knowledgeable partner provides a higher level of audit service or a predetermined level of audit service more efficiently. We leave this to empirical testing. The second research question concerns whether the effects of personal knowledge, if any, are moderated by whether a partner belongs to a Big 4 firm. In other words, it relates to whether the relationship between auditor personal knowledge and firm organizational knowledge in Big 4 firms differs from the relationship in other firms.

As discussed, we found significant differences in the three measures of personal knowledge between Big 4 and non-Big 4 partners. Moreover, prior studies generally find that Big 4 firms provide higher-quality audits than non-Big 4 firms in terms of discretionary accruals (Krishnan, 2003), the *ex ante* cost of capital (Khurana and Raman, 2004), and analyst forecast accuracy (Behn et al., 2008). Furthermore, existing studies generally conclude that Big 4 firms are able to charge higher audit fees than non-Big 4 firms (the so-called Big 4 premium) (e.g., Choi et al., 2008; Hay et al., 2006).

Sample and Data

Our sample selection begins with all Japanese listed companies in 2010 ($n = 3,583$; see also Table 1). We first excluded 12 companies for which two or more audit firms jointly conducted the audit or whose fiscal year in 2010 was not for a full 365 days. We then removed companies in the finance-related industries (i.e., Banks, Securities, Insurance, and Other Financial Businesses) ($n = 178$). Finally, we excluded 594 companies for which the necessary financial and other data are unavailable. Our final sample comprises 2,799 companies, of which 2,040 companies are Big 4 clients and 759 companies are non-Big 4 clients. We decided to include only 2010 audits in the analysis because one of the variables we are interested in is the depth of auditor personal knowledge (defined as the number of years an engagement partner has been consecutively involved with a particular client), for which we have data on engagement partners for the seven years from 2004 to 2010.

We hand-collected data on the engagement partners (name and firm affiliation) from the auditor's reports included in the company annual reports. We collected audit fee data from the *2012 Report on Auditor and Audit Fees of Publicly Listed Companies* (Study Group on Auditor and Audit Fee Issues, 2011) and each company's annual report. We obtained the remaining financial data from the *Corporate Financial Data Bank* developed by the Japan Economic Research Institute, Inc.

Variables and Model Specification

Following earlier studies, we specify the following regression model.

$$\begin{aligned}
\ln FEE = & \alpha_0 + \alpha_1 LEAD_YEARS + \alpha_2 LEAD_CLIENTS + \alpha_3 LEAD_EXPERTISE \\
& + \alpha_4 SHARE + \alpha_5 NO_PARTNERS + \alpha_6 \ln Assets + \alpha_7 SUBS + \alpha_8 CATA \\
& + \alpha_9 QUICK + \alpha_{10} ROA + \alpha_{11} LEV + \alpha_{12} LOSS + \alpha_{13} SEC \\
& + \alpha_{14} industry\ dummies + \varepsilon
\end{aligned}$$

The dependent variable, *lnFEE*, is the natural log of audit fees paid to the audit firm. In this analysis, we are most interested in four variables: *LEAD_YEARS*, *LEAD_CLIENTS*, *LEAD_EXPERTISE*, and *SHARE*. *LEAD_YEARS* relates to the depth of auditors' personal knowledge and is defined as the number of years a lead engagement partner (an engagement partner who first signed an auditor's report) has provided audit services to a particular client. As our dataset covers the period from 2004 to 2010, this variable ranges from 1 to 7. As a variable to measure the width of personal knowledge, we include *LEAD_CLIENTS*, which is the number of clients the lead engagement partner served as an engagement partner in 2010. *LEAD_EXPERTISE* is a variable used to measure the level of industry expertise of a lead engagement partner and is defined as (*LEAD_CLIENTS* – the number of industries with which the partner is involved in 2010 + 1).⁴ As the variable indicating the organizational knowledge of audit firms, we include *SHARE*, which represents the audit fees paid by clients of the firm compared with the total audit fees paid by companies in the industry (i.e., fee-based market share in the industry). In addition, to control for the total effort of engagement partners, we include the number of engagement partners (*NO_PARTNERS*) in the regression.

⁴ As discussed, an auditor's report in Japan is generally signed by two or more engagement partners. As a robustness check, we repeated the regression analysis using the mean or maximum values of the engagement partners, rather than the values of the lead engagement partners. The results obtained were not qualitatively different from those reported in the main results section.

We select control variables that have been commonly found in prior studies to influence audit fees (Hay et al., 2006), particularly in Japan (Fukukawa, 2011; Kim and Fukukawa, 2013). To control for client size, we specify the natural log of the client's total assets (*lnAssets*). To proxy client complexity, we specify *SUBS* and *CATA*, where *SUBS* is the square root of the number of consolidated subsidiaries and *CATA* is the ratio of current assets to total assets. The size and complexity variables are expected to positively affect audit fees.

Four variables (*QUICK*, *ROA*, *LEV*, and *LOSS*) are included to control for client risk. *QUICK* is the ratio of quick assets to current liabilities. *ROA* is income before interest and tax divided by total assets. *LEV* is the ratio of long-term debt to total assets. We winsorized these three variables at the 99th percentile as in some existing studies (e.g., Carson and Fargher, 2007; Fukukawa, 2011). *LOSS* is an indicator variable that equals one if the client reported a loss in the fiscal year, and zero otherwise. We expect that the higher the client risk, the higher the audit fees. As a final client attribute, we include *SEC*, which is an indicator variable that is equal to one if the client is a US Securities and Exchange Commission (SEC) registrant; studies have found that audit fees for SEC registrants are generally much higher than those for other companies (Fukukawa, 2011; Kim and Fukukawa, 2013). Finally, we include industry dummy variables to control for differences in audit fees by industry.

Descriptive Statistics

Table 7 provides descriptive statistics of the variables included in the regression model. To examine the differences between Big 4 and non-Big 4 firms, we conduct *t*-tests and chi-squared tests.

[TABLE 7 ABOUT HERE]

Some differences between Big 4 and non-Big 4 firms are noteworthy. First, audit fees are significantly higher for Big 4 firms. Consistent with this result, the clients of Big 4 firms are typically larger (*lnAssets*), more complex (*SUBS*), and less risky (*ROA* and *LOSS*) than the clients of non-Big 4 firms. As for the auditor knowledge variables, the lead engagement partners of Big 4 firms usually have deeper (*LEAD_YEARS*) and wider (*LEAD_CLIENTS*) knowledge of a client. However, there is no significant difference in the industry expertise of lead partners (*LEAD_EXPERTISE*). Organizational industry expertise, as measured in terms of fee-based market share, is also higher for Big 4 firms.

Table 8 includes the Pearson (product moment) correlation matrix. As shown, *lnFEE* is significantly correlated with all independent variables (at the 5% level), although the direction of some of the correlations lies opposite to our expectations (i.e., *CATA*, *ROA*, *LEV*, and *LOSS*). The correlation between *LEAD_YEARS* and *lnFEE* (0.048) is significantly positive, and *lnFEE* is negatively correlated with *LEAD_CLIENTS* and *LEAD_EXPERTISE* (−0.055 and −0.075, respectively). In addition, *SHARE* is positively correlated with *lnFEE* (0.339). These results warrant the use of multivariate analysis to further investigate the relationships between audit fees and knowledge-related and other variables. Furthermore, some of the correlations between the personal knowledge variables are significantly positive. In particular, the correlation between *LEAD_CLIENTS* and *LEAD_EXPERTISE* is high (0.844). Upon closer examination, the correlation turns out to be very high for the non-Big 4 sample (0.950). To avoid any potential problem with multicollinearity, we include these variables sequentially in the regression analysis for the non-Big 4 audit firms.

[TABLE 8 ABOUT HERE]

Results

Table 9 presents the regression results. As shown, the explanatory power of the model in terms of adjusted R-squared is higher for the Big 4 sample (0.83) than the non-Big 4 sample (0.60).⁵

[TABLE 9 ABOUT HERE]

In terms of the estimated coefficients, *LEAD_YEARS* has a significant negative impact on audit fees (at the 5% level for the Big 4 sample and the 10% level for the non-Big 4 sample). This means that the deeper a lead engagement partner's knowledge of a client, the lower the audit fee, implying that a knowledgeable engagement partner is able to provide audit services more efficiently. Second, *LEAD_CLIENTS* exerts a significant negative impact on audit fees, but only for the sample of Big 4 clients. Third, *LEAD_EXPERTISE* influences audit fees positively, but also only for the Big 4 sample. That is, if a lead engagement partner from a Big 4 firm serves more clients, the audit fee is lower. In addition, a Big 4 lead partner's higher industry expertise leads to higher audit fees. However, such significant effects for *LEAD_CLIENTS* and *LEAD_EXPERTISE* are not found among non-Big 4 partners.

Conversely, *SHARE* affects audit fees positively only for the non-Big 4 sample. This means that the larger the industry market share of a non-Big 4 firm, the higher the fees that the firm can charge in that industry. However, this does not hold true for Big 4 firms. These

⁵ As all variance inflation factors are smaller than 3.9, multicollinearity is not too severe a problem.

results may be related to the fact that the market shares of non-Big 4 firms are much smaller than those of Big 4 firms, which we can interpret as follows. When the market share in an industry is below the threshold level necessary to establish greater industry expertise (as in many cases in non-Big 4 audit firms), a higher share brings greater expertise and thus higher fees. However, an audit firm with a market share above the threshold level (as for Big 4 firms) already has high expertise and cannot further increase its industry expertise by increasing market share. The positive association between the number of engagement partners (*NO_PARTNERS*) and audit fees is significant at the 1% level for the Big 4 firm sample and the 10% level for the non-Big 4 firm sample, which implies that increased total effort by engagement partners leads to higher fees.

The remaining control variables generally influence audit fees as hypothesized. Client size (*lnAssets*) and complexity (*SUBS*) are positively associated with audit fees. For the Big 4 firm sample, audit fees are affected positively by *CATA*, *LEV*, and *LOSS* and negatively by *QUICK*. For the non-Big 4 firm sample, *QUICK* and *ROA* have a negative relationship with audit fees. These differences in audit fee determinants between Big 4 and non-Big 4 firms may reflect variation in audit pricing behavior or client characteristics. Finally, audit firms charge higher fees for SEC registrants.

In summary, for Big 4 audits, an engagement partner with deeper and wider knowledge provides audit services more efficiently while a partner with greater industry expertise can earn higher fees. Conversely, firm organizational knowledge, as measured by industry market share, does not affect the level of audit fees. In contrast, for non-Big 4 audits, when a firm has more organizational knowledge, it can earn higher fees. However, the personal knowledge of audit partners appears to have little effect on audit fees, with only the

depth of knowledge marginally influencing audit fees. These differences in the effects of the auditor knowledge variables across Big 4 and non-Big 4 firms may result from differences in the amount and content of the personal knowledge of partners, firm organizational knowledge, and their relationship.

CONCLUSIONS

In this study, we developed a conceptual framework for auditor knowledge, where such knowledge is categorized into personal knowledge and firm organizational knowledge. In turn, in our framework, auditor personal knowledge is comprised of three important elements: the depth of knowledge of a particular client, the width of knowledge obtained through audit experience with other clients, and industry expertise cultivated by providing audit services to more clients in fewer industries.

In an attempt to measure the three components of personal knowledge using archival data, we proposed three variables, defined as the number of years an engagement partner consecutively serves a particular client (the depth of knowledge), the number of clients with which the partner is involved as an engagement partner in the fiscal year (the width of knowledge), and the number of clients a partner serves as an engagement partner less the number of industries in which the clients operate plus one, respectively. Using a unique dataset on the individual identity of engagement partners, we provided detailed descriptive statistics for these variables. Overall, we found some differences in auditor personal knowledge between Big 4 and non-Big 4 partners and among the partners in Big 4 firms.

In addition, we preliminarily examined whether and how these knowledge-related variables influenced audit fees. We found that the depth of knowledge has a negative impact

on audit fees. Similarly, the width of knowledge is negatively associated with audit fees for the Big 4 audit firms. These results indicate that these components are useful for conducting efficient audits. We also found that Big 4 partners with greater industry expertise earn higher fees. In contrast, we found that audit firm organizational knowledge has a positive effect on audit fees, but only for non-Big 4 firms. We argue that these differences between Big 4 and non-Big 4 firms reflect variation in the amount and content of personal knowledge and organizational knowledge and the relationship between them.

This work could be extended in several important ways. First, the relationship between auditor personal knowledge and firm organizational knowledge could be examined more closely. In particular, this study addressed only one aspect of firm organizational knowledge. Supplementary data on firm organizational knowledge gathered through interview or questionnaires would enable us to better discern how firm organizational knowledge accumulates and how it interacts with the personal knowledge of the firm's partners. Second, this study only preliminarily examined the effects of knowledge-related variables on audit fees. Further investigation is then necessary to ascertain whether these variables also impact upon audit quality. Finally, it would be interesting to examine the nature of the personal relationships and networks between partners constructed in a particular audit firm. Whether we can group partners across a number of criteria (e.g., premerger audit firms to which partners belonged) and how such groups, if any, function in the firm are important research questions that presently remain outstanding.

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Figure 1: Conceptual Framework for Auditor Knowledge

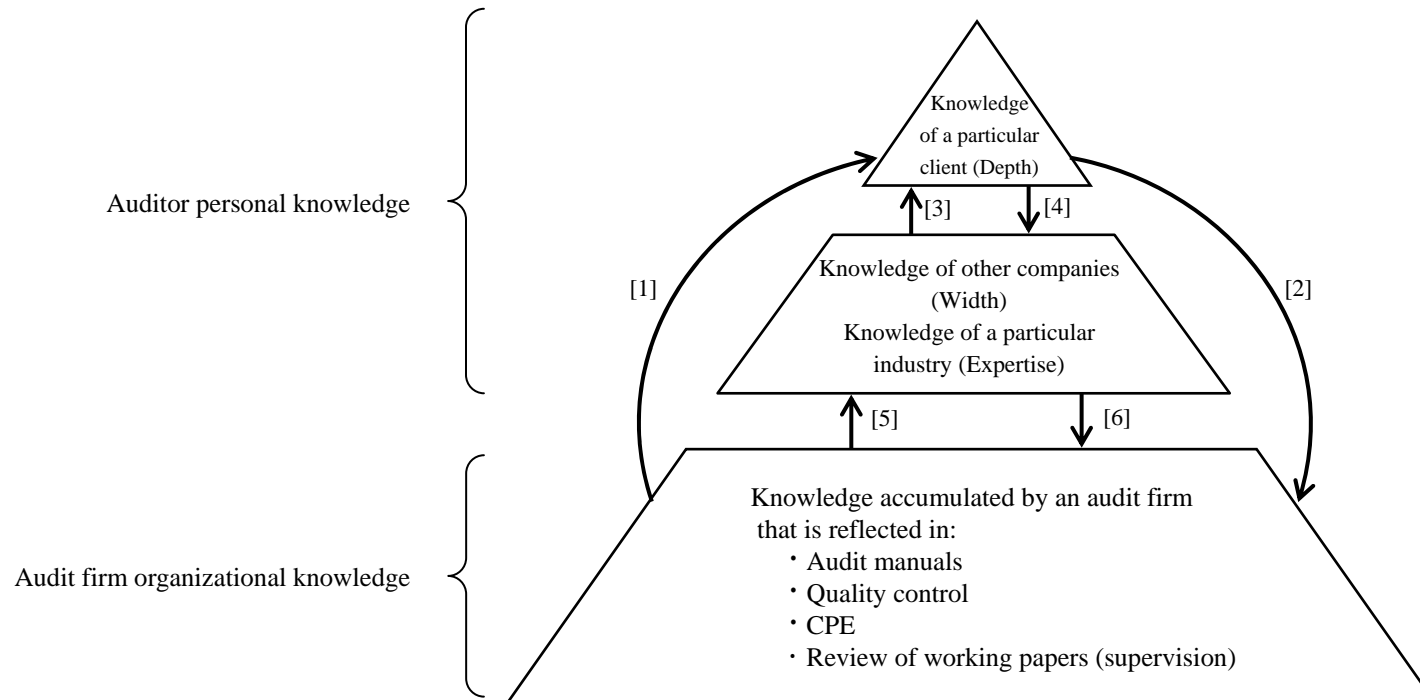


Table 1: Numbers of Clients and Market Shares

Industry	ShinNihon	Tohmatsu	Azsa	Aarata	Others	Total
Food	35 (26.1)	41 (30.6)	21 (15.7)	1 (0.7)	36 (26.9)	134 (3.7)
Fiber Products	13 (22.4)	11 (19.0)	12 (20.7)	2 (3.4)	20 (34.5)	58 (1.6)
Pulp/Paper	7 (30.4)	8 (34.8)	3 (13.0)	0 (0.0)	5 (21.7)	23 (0.6)
Chemicals	64 (33.0)	37 (19.1)	37 (19.1)	2 (1.0)	54 (27.8)	194 (5.4)
Pharmaceuticals	13 (23.2)	20 (35.7)	15 (26.8)	1 (1.8)	7 (12.5)	56 (1.6)
Oil	3 (27.3)	1 (9.1)	3 (27.3)	3 (27.3)	1 (9.1)	11 (0.3)
Rubber Products	8 (34.8)	3 (13.0)	5 (21.7)	0 (0.0)	7 (30.4)	23 (0.6)
Ceramic Products	12 (19.7)	20 (32.8)	13 (21.3)	0 (0.0)	16 (26.2)	61 (1.7)
Steel	15 (28.3)	7 (13.2)	17 (32.1)	3 (5.7)	11 (20.8)	53 (1.5)
Nonferrous Metals	29 (22.5)	31 (24.0)	19 (14.7)	3 (2.3)	47 (36.4)	129 (3.6)
Machinery	61 (26.5)	57 (24.8)	38 (16.5)	7 (3.0)	57 (29.1)	230 (6.4)
Electric Appliances	86 (28.9)	76 (25.5)	52 (17.4)	7 (2.3)	77 (25.8)	298 (8.3)
Shipbuilding	2 (28.6)	1 (14.3)	4 (57.1)	0 (0.0)	0 (0.0)	7 (0.2)
Automobile	27 (33.3)	17 (21.0)	17 (21.0)	10 (12.3)	10 (12.3)	81 (2.3)
Transportation Equipment	2 (12.5)	3 (18.8)	3 (18.8)	0 (0.0)	8 (50.0)	16 (0.4)
Precision Equipment	10 (20.0)	17 (34.0)	10 (20.0)	0 (0.0)	13 (26.0)	50 (1.4)
Other Manufacturing	27 (21.4)	24 (19.0)	27 (21.4)	3 (2.4)	45 (35.7)	126 (3.5)
Fisheries	4 (36.4)	2 (18.2)	2 (18.2)	0 (0.0)	3 (27.3)	11 (0.3)
Mining	5 (50.0)	1 (10.0)	3 (30.0)	0 (0.0)	1 (10.0)	10 (0.3)
Construction	49 (28.2)	33 (19.0)	39 (22.4)	0 (0.0)	53 (30.5)	174 (4.9)
Trading	81 (20.6)	108 (27.4)	73 (18.5)	13 (3.3)	119 (30.2)	394 (11.0)
Retail	58 (22.8)	87 (34.3)	44 (17.3)	3 (1.2)	62 (24.4)	254 (7.1)
Banks	37 (40.2)	25 (27.2)	26 (28.3)	1 (1.1)	3 (3.3)	92 (2.6)
Securities	6 (27.3)	4 (18.2)	6 (27.3)	1 (4.5)	5 (22.7)	22 (0.6)
Insurance	4 (66.7)	0 (0.0)	0 (0.0)	2 (33.3)	0 (0.0)	6 (0.2)
Other Financial Businesses	16 (27.6)	14 (24.1)	10 (17.2)	1 (1.7)	17 (29.3)	58 (1.6)
Real Estate	30 (28.0)	14 (13.1)	15 (14.0)	0 (0.0)	48 (44.9)	107 (3.0)
Railroad/Bus	13 (46.4)	2 (7.1)	10 (35.7)	0 (0.0)	3 (10.7)	28 (0.8)
Land Transportation	11 (31.4)	10 (28.6)	10 (28.6)	0 (0.0)	4 (11.4)	35 (1.0)
Marine Transportation	10 (58.8)	2 (11.8)	2 (11.8)	0 (0.0)	3 (17.6)	17 (0.5)
Air Transportation	2 (40.0)	0 (0.0)	2 (40.0)	0 (0.0)	1 (20.0)	5 (0.1)
Warehouse	14 (35.0)	5 (12.5)	10 (25.0)	0 (0.0)	11 (27.5)	40 (1.1)
Communication	3 (8.6)	11 (31.4)	11 (31.4)	0 (0.0)	10 (28.6)	35 (1.0)
Electricity	4 (35.4)	4 (36.4)	2 (18.2)	0 (0.0)	1 (9.1)	11 (0.3)
Gas	2 (15.4)	2 (15.4)	5 (38.5)	0 (0.0)	4 (30.8)	13 (0.4)
Services	187 (25.9)	201 (27.8)	129 (17.8)	15 (2.1)	191 (26.4)	723 (20.2)
Total	950 (26.5)	899 (25.1)	695 (19.4)	78 (2.2)	963 (26.9)	3585 (100.0)

Table 2: Audit Fees and Market Shares

Industry	ShinNihon	Tohmatsu	Azsa	Aarata	Others	Total
Food	2480 (34.5)	2175 (30.3)	1449 (20.2)	33 (0.5)	1043 (14.5)	7180 (3.2)
Fiber Products	973 (31.0)	630 (20.1)	798 (25.4)	131 (4.2)	609 (19.4)	3141 (1.4)
Pulp/Paper	769 (53.0)	237 (16.3)	349 (24.1)	0 (0.0)	95 (6.6)	1450 (0.7)
Chemicals	4886 (43.3)	1913 (16.9)	2666 (23.6)	329 (2.9)	1493 (13.2)	11287 (5.1)
Pharmaceuticals	827 (25.9)	1180 (36.9)	964 (30.2)	72 (2.3)	154 (4.8)	3197 (1.4)
Oil	1157 (66.2)	28 (1.6)	317 (18.1)	223 (12.8)	24 (1.4)	1749 (0.8)
Rubber Products	348 (27.1)	346 (26.9)	416 (32.3)	0 (0.0)	176 (13.7)	1286 (0.6)
Ceramic Products	845 (31.9)	698 (26.3)	727 (27.4)	0 (0.0)	380	2650 (1.2)
Steel	977 (27.2)	598 (16.7)	1546 (43.1)	130 (3.6)	337 (9.4)	3588 (1.6)
Nonferrous Metals	1583 (24.2)	1567 (23.9)	1719 (26.3)	233 (3.6)	1441 (22.0)	6543 (3.0)
Machinery	3056 (28.3)	2422 (22.5)	2685 (24.9)	528 (4.9)	2096 (19.4)	10787 (4.9)
Electric Appliances	10252 (37.7)	3941 (14.5)	8208 (30.1)	1783 (6.5)	3045 (11.2)	27229 (12.3)
Shipbuilding	467 (44.4)	99 (9.4)	485 (46.1)	0 (0.0)	0 (0.0)	1051 (0.5)
Automobile	2714 (33.4)	678 (8.3)	1663 (20.5)	2665 (32.8)	404 (5.0)	8124 (3.7)
Transportation Equipment	88 (16.6)	119 (22.5)	101 (19.1)	0 (0.0)	221 (41.8)	529 (0.2)
Precision Equipment	598 (20.8)	919 (31.9)	936 (32.5)	0 (0.0)	427 (14.8)	2880 (1.3)
Other Manufacturing	1102 (21.2)	1048 (20.1)	1557 (29.9)	109 (2.1)	1389 (26.7)	5205 (2.3)
Fisheries	206 (29.6)	45 (6.5)	360 (51.7)	0 (0.0)	85 (12.2)	696 (0.3)
Mining	456 (67.8)	51 (7.6)	138 (20.5)	0 (0.0)	28 (4.2)	673 (0.3)
Construction	3010 (36.5)	1507 (18.3)	2087 (25.3)	0 (0.0)	1644 (19.9)	8248 (3.7)
Trading	4210 (17.8)	9365 (39.5)	5738 (24.2)	1182 (5.0)	3222 (13.6)	23717 (10.7)
Retail	2641 (22.1)	4555 (38.1)	2888 (24.1)	127 (1.1)	1751 (14.6)	11962 (5.4)
Banks	6394 (31.6)	8458 (41.8)	5198 (25.7)	72 (0.4)	100 (0.5)	20222 (9.1)
Securities	1422 (57.4)	170 (6.9)	614 (24.8)	35 (1.4)	236 (9.5)	2477 (1.1)
Insurance	899 (46.1)	0 (0.0)	0 (0.0)	1049 (53.9)	0 (0.0)	1948 (0.9)
Other Financial Businesses	1039 (22.7)	1559 (34.0)	1310 (28.6)	60 (1.3)	619 (13.5)	4587 (2.1)
Real Estate	1893 (38.9)	510 (10.5)	1067 (22.0)	0 (0.0)	1391 (28.6)	4861 (2.2)
Railroad/Bus	1289 (30.9)	526 (12.6)	2267 (54.3)	0 (0.0)	94 (2.3)	4176 (1.9)
Land Transportation	621 (35.6)	468 (26.9)	530 (30.4)	0 (0.0)	124 (7.1)	1743 (0.8)
Marine Transportation	434 (38.4)	338 (29.9)	298 (26.4)	0 (0.0)	59 (5.2)	1129 (0.5)
Air Transportation	209 (59.4)	0 (0.0)	121 (34.4)	0 (0.0)	22 (6.3)	352 (0.2)
Warehouse	444 (33.2)	220 (16.4)	453 (33.8)	0 (0.0)	222 (16.6)	1339 (0.6)
Communication	213 (3.1)	550 (7.9)	5179 (74.5)	0 (0.0)	1009 (14.5)	6951 (3.1)
Electricity	585 (41.8)	436 (31.2)	327 (23.4)	0 (0.0)	50 (3.6)	1398 (0.6)
Gas	57 (6.8)	113 (13.5)	574 (68.8)	0 (0.0)	90 (10.8)	834 (0.4)
Services	7218 (27.3)	7482 (28.3)	5985 (22.7)	643 (2.4)	5064 (19.2)	26392 (11.9)
Total	66362 (29.9)	54951 (24.8)	61720 (27.9)	9404 (4.2)	29144 (13.2)	221581 (100.0)

Table 3: Length of Partners' Continuous Involvement with a Particular Client (Years)

Number of Years	1	2	3	4	5	6	7	Total	Mean ^a
ShinNihon	453 (20.7)	344 (15.4)	312 (14.0)	366 (16.4)	522 (23.3)	169 (7.6)	70 (3.1)	2236 (27.7)	3.42
Tohmatsu	333 (17.2)	340 (17.6)	304 (15.7)	351 (18.1)	312 (16.1)	213 (11.0)	81 (4.2)	1934 (24.0)	3.48
Azsa	296 (17.7)	304 (18.2)	317 (19.0)	275 (16.5)	265 (15.9)	130 (7.8)	83 (5.0)	1670 (20.7)	3.38
Aarata	29 (21.6)	31 (23.1)	19 (14.2)	30 (22.4)	17 (12.7)	4 (3.0)	4 (3.0)	134 (1.7)	3.02
Others	442 (21.1)	527 (25.2)	358 (17.1)	355 (17.0)	255 (12.2)	93 (4.4)	62 (3.0)	2092 (25.9)	2.99
Total	1553 (19.3)	1546 (19.2)	1310 (16.2)	1377 (17.1)	1371 (17.0)	609 (7.6)	300 (3.7)	8066 (100.0)	3.31

^a: Tukey test result indicates that the mean for Aarata is significantly lower than those for ShinNihon and Tohmatsu (at the 10% and 5% level, respectively) and the mean for Others is significantly lower than those for ShinNihon, Tohmatsu and Azsa (all at the 1% level).

Table 4: Engagement Partners: Number of Clients with which Partners are Involved

Number of Clients	1	2	3	4	5	6	7	8	9	10	11	12	13	14	17	19	20	24	Total	Mean ^a
ShinNihon	82 (14.4)	94 (16.5)	103 (18.1)	86 (15.1)	68 (12.0)	52 (9.2)	33 (5.8)	25 (4.6)	10 (1.8)	10 (1.8)	3 (0.5)	0 (0.0)	1 (0.2)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	568 (23.7)	3.96
Tohmatsu	74 (16.7)	70 (15.8)	60 (13.5)	60 (13.5)	45 (10.2)	34 (7.7)	34 (7.7)	25 (5.6)	15 (3.4)	11 (2.5)	6 (1.4)	4 (0.9)	1 (0.2)	2 (0.5)	1 (0.2)	1 (0.2)	0 (0.0)	0 (0.0)	443 (18.5)	4.37
Azsa	76 (16.8)	88 (19.4)	76 (16.8)	68 (15.0)	57 (12.6)	36 (7.9)	29 (6.4)	9 (2.0)	9 (2.0)	1 (0.2)	0 (0.0)	4 (0.9)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	453 (18.9)	3.68
Aarata	14 (33.3)	6 (14.3)	7 (16.7)	6 (14.3)	1 (2.4)	3 (7.1)	3 (7.1)	0 (0.0)	2 (4.8)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	42 (1.8)	3.17
Others	397 (44.6)	205 (23.0)	120 (13.5)	71 (8.0)	44 (4.9)	28 (3.1)	11 (1.2)	8 (0.8)	2 (0.2)	1 (0.1)	1 (0.1)	2 (0.2)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	1 (0.1)	1 (0.1)	891 (37.2)	2.33
Total	643 (26.8)	463 (19.3)	366 (15.3)	291 (12.1)	215 (9.0)	153 (6.4)	110 (4.6)	67 (2.8)	38 (1.6)	23 (1.0)	10 (0.4)	10 (0.4)	2 (0.1)	2 (0.1)	1 (0.0)	1 (0.0)	1 (0.0)	1 (0.0)	2397 (100.0)	3.37

^a: Tukey test result indicates that the mean for Tohmatsu is significantly higher than that for other Big 4 firms (at either the 1% or 5% level) and the mean for Others is significantly lower than that for other firms (at the 1% level).

Table 5: Engagement Partners: Number of Industries with which Partners are Involved

Number of Industries	1	2	3	4	5	6	7	8	9	10	11	12	Total	Mean ^a
ShinNihon	100 (17.6)	131 (23.1)	126 (22.2)	84 (14.8)	65 (11.4)	32 (5.6)	19 (3.3)	9 (1.6)	2 (0.4)	0 (0.0)	0 (0.0)	0 (0.0)	568 (23.7)	3.20
Tohmatsu	81 (18.3)	88 (19.9)	84 (19.0)	78 (17.6)	52 (11.7)	34 (7.7)	16 (3.6)	4 (0.9)	3 (0.7)	1 (0.2)	1 (0.2)	1 (0.2)	443 (18.5)	3.36
Azsa	86 (19.0)	109 (24.1)	108 (23.8)	66 (14.6)	43 (9.5)	18 (4.0)	14 (3.1)	8 (1.8)	1 (0.2)	0 (0.0)	0 (0.0)	0 (0.0)	453 (18.9)	3.06
Aarata	16 (38.1)	11 (26.2)	6 (14.3)	4 (9.5)	1 (2.4)	3 (7.1)	1 (2.4)	0 (0.0)	0 (0.2)	0 (0.0)	0 (0.0)	0 (0.0)	42 (1.8)	2.43
Others	397 (47.9)	205 (25.7)	120 (13.6)	72 (7.0)	44 (4.3)	28 (0.8)	11 (0.3)	8 (0.4)	2 (0.0)	1 (0.0)	1 (0.0)	2 (0.0)	891 (37.2)	2.00
Total	709 (29.6)	568 (23.7)	445 (18.6)	294 (12.3)	199 (8.3)	94 (3.9)	53 (2.2)	25 (1.0)	6 (0.3)	1 (0.0)	1 (0.0)	1 (0.0)	2397 (100.0)	2.74

^a. Tukey test result indicates that the mean for ShinNihon is significantly higher than those for Aarata and Others (at the 5% and 1% level, respectively), the mean for Tohmatsu is significantly higher than those for Azsa, Aarata, and Others (at the 10%, 1%, and 1% level, respectively), and the mean for Azsa is significantly higher than that for Others (at the 1% level).

Industry Expertise ^a	1	2	3	4	5	6	7	8	9	10	13	17	Total	Mean ^b
ShinNihon	306 (53.9)	153 (26.9)	69 (12.1)	26 (4.6)	7 (1.2)	5 (0.9)	2 (0.4)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	568 (23.7)	1.76
Tohmatsu	233 (52.6)	101 (22.8)	50 (11.3)	28 (6.3)	15 (3.4)	7 (1.6)	4 (0.9)	1 (0.2)	2 (0.5)	1 (0.2)	1 (0.2)	0 (0.0)	443 (18.5)	2.01
Azsa	275 (60.7)	110 (24.3)	42 (9.3)	19 (4.2)	5 (1.1)	2 (0.4)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	453 (18.9)	1.62
Aarata	26 (61.9)	6 (14.3)	7 (16.7)	1 (2.4)	2 (4.8)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	42 (1.8)	1.74
Others	713 (80.0)	118 (13.2)	34 (3.8)	15 (1.7)	8 (0.9)	0 (0.0)	1 (0.1)	0 (0.0)	0 (0.0)	0 (0.0)	1 (0.0)	1 (0.0)	891 (37.2)	1.33
Total	1553 (64.8)	488 (18.7)	202 (8.4)	89 (3.7)	37 (1.5)	14 (0.6)	7 (0.3)	1 (0.0)	2 (0.1)	1 (0.0)	2 (0.0)	1 (0.0)	2397 (100.0)	1.62

^a: Partner industry expertise is defined as the number of clients with which a partner is involved minus the number of industries in which the clients operate plus one.

^b: Tukey test result indicates that the mean for Tohmatsu is significantly higher than those for ShinNihon, Azsa, and Others (all at the 1% level) and the mean for Others is significantly lower than those for ShinNihon and Azsa (both at the 1% level).

Table 7: Descriptive Statistics

Variable	Pooled Sample (n = 2,799)		Big 4 Sample (n = 2,040)		Non-Big 4 Sample (n = 759)		<i>t</i> -test or chi-squared test
	Mean	S.D.	Mean	S.D.	Mean	S.D.	
<i>lnFEE</i>	3.70	0.75	3.85	0.76	3.31	0.52	***
<i>LEAD_YEARS</i>	3.62	1.73	3.71	1.74	3.39	1.68	***
<i>LEAD_CLIENTS</i>	5.95	3.63	6.40	3.02	4.74	4.72	***
<i>LEAD_EXPERTISE</i>	2.57	2.26	2.62	1.78	2.44	3.22	
<i>SHARE</i>	20.50	14.60	27.70	10.10	1.10	1.40	***
<i>NO_PARTNERS</i>	2.26	0.49	2.29	0.51	2.18	0.40	***
<i>lnAssets</i>	17.47	1.67	17.75	1.65	16.72	1.50	***
<i>SUBS</i>	3.32	2.82	3.61	3.10	2.54	1.61	***
<i>CATA</i>	55.10	19.00	55.00	18.80	55.40	19.80	
<i>QUICK</i>	166.30	139.60	168.20	137.80	161.30	144.20	
<i>ROA</i>	1.70	6.10	2.40	4.50	-0.20	8.70	***
<i>LEV</i>	16.60	13.20	16.40	13.00	17.10	13.60	
<i>LOSS</i>	0.15	0.36	0.12	0.32	0.24	0.43	***
<i>SEC</i>	0.01	0.10	0.01	0.12	0.00	0.04	***

*** p < 0.01

Table 8: Pearson Correlation Matrix

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1. <i>lnFEE</i>	1.000													
2. <i>LEAD_YEARS</i>	0.048*	1.000												
3. <i>LEAD_CLIENTS</i>	-0.055*	0.035	1.000											
4. <i>LEAD_EXPERTISE</i>	-0.075*	0.005	0.844*	1.000										
5. <i>SHARE</i>	0.339*	0.078*	0.152*	0.021	1.000									
6. <i>NO_PARTNERS</i>	0.483*	0.044*	-0.038*	-0.041*	0.197*	1.000								
7. <i>lnAssets</i>	0.822*	0.091*	-0.068*	-0.114*	0.296*	0.449*	1.000							
8. <i>SUBS</i>	0.803*	0.063*	-0.061*	-0.076*	0.202*	0.449*	0.730*	1.000						
9. <i>CATA</i>	-0.131*	-0.024	0.057*	0.073*	-0.057*	-0.098*	-0.244*	-0.129*	1.000					
10. <i>QUICK</i>	-0.156*	-0.015	0.041*	0.051*	-0.009	-0.112*	-0.180*	-0.133*	0.333*	1.000				
11. <i>ROA</i>	0.109*	0.065*	0.055*	0.030	0.146*	0.056*	0.236*	0.076*	0.059*	0.089*	1.000			
12. <i>LEV</i>	0.205*	0.019	-0.058*	-0.060*	0.037*	0.146*	0.233*	0.234*	-0.550*	-0.398*	-0.139*	1.000		
13. <i>LOSS</i>	-0.114*	-0.069*	-0.044*	-0.008	-0.133*	-0.049*	-0.242*	-0.095*	-0.023	-0.033	-0.679*	0.086*	1.000	
14. <i>SEC</i>	0.364*	0.006	-0.051*	-0.037	0.086*	0.178*	0.250*	0.420*	-0.034	-0.009	0.033	0.041*	-0.033	1.000

* $p < 0.05$

Table 9: Regression Results

	Pooled Sample	Big 4 Sample	Non-Big 4 Sample [1]	Non-Big 4 Sample [2]
Constant	-1.2186 [-10.73]***	-1.5287 [-11.42]***	0.3102 [1.42]	0.3195 [1.46]
<i>LEAD_YEARS</i>	-0.0103 [-2.83]***	-0.0079 [-1.97]**	-0.014 [-1.89]*	-0.014 [-1.90]*
<i>LEAD_CLIENTS</i>	-0.0054 [-1.62]	-0.0193 [-5.30]***	0.0014 [0.51]	
<i>LEAD_EXPERTISE</i>	0.0057 [1.07]	0.0161 [2.58]**		0.0006 [0.17]
<i>SHARE</i>	0.5797 [12.21]***	0.0607 [0.82]	8.7476 [7.52]***	8.8264 [7.64]***
<i>NO_PARTNERS</i>	0.0951 [6.46]***	0.1001 [6.18]***	0.0556 [1.75]*	0.0565 [1.78]*
<i>lnAssets</i>	0.2503 [37.44]***	0.2764 [36.17]***	0.1621 [12.19]***	0.1616 [12.18]***
<i>SUBS</i>	0.0931 [24.57]***	0.0827 [20.79]***	0.109 [9.95]***	0.1089 [9.94]***
<i>CATA</i>	0.2956 [6.56]***	0.4131 [7.81]***	-0.0398 [-0.50]	-0.0392 [-0.50]
<i>QUICK</i>	-0.0204 [-3.93]***	-0.0239 [-4.05]***	-0.0167 [-1.73]*	-0.0165 [-1.71]*
<i>ROA</i>	-0.5125 [-3.58]***	-0.2481 [-1.17]	-0.5444 [-2.71]***	-0.5409 [-2.70]***
<i>LEV</i>	0.0937 [1.47]	0.1862 [2.47]**	-0.0963 [-0.88]	-0.0955 [-0.87]
<i>LOSS</i>	0.0604 [2.51]**	0.0674 [2.29]**	0.0605 [1.50]	0.0601 [1.49]
<i>SEC</i>	0.4247 [6.18]***	0.4326 [6.45]***	0.5842 [1.70]*	0.5818 [1.69]*
R-squared	0.8098	0.8377	0.6216	0.6215
Adj. R-squared	0.8068	0.8341	0.6000	0.5999
N	2,799	2,040	759	759

* p < 0.1, ** p < 0.05, *** p < 0.01.

Figures in square brackets are t-statistics.