

# **Audit Pricing and Cost Strategies of Japanese Big 3 Firms**

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## **Abstract**

The purposes of this study are to investigate whether and how audit fee determinants examined in prior studies influence audit fees and costs in the Japanese audit market, and to examine whether audit pricing and cost strategies differ among Japanese Big 3 firms. Prior studies have not fully examined audit costs and differences in audit pricing and cost strategies among large audit firms. Based on data on the 2006 audits of publicly listed companies conducted by Japanese Big 3 firms, this study finds that although many audit fee determinants also influence audit costs, some of the other client-related and auditor-related variables influence only either audit fees or costs or have an impact on audit fees and audit costs in opposite directions. Furthermore, the relationships between audit fees/costs and the determinants vary widely depending on whether the client is recognized as an excellent company as well as among Big 3 firms.

**Keywords:** audit fees, audit costs, Japanese audit market, bargaining power

**Data Availability:** Data used in this study are available from public sources.

# **Audit Pricing and Cost Strategies of Japanese Big 3 Firms**

## **INTRODUCTION**

This study examines how audit fees and costs of Japanese Big 3 firms are influenced by various factors such as client size, complexity, risk, and bargaining power. It also examines whether and how audit pricing and cost strategies differ among these firms. Much research effort has been devoted to investigating audit fee determinants. However, few studies directly examine whether the audit fee determinants also influence audit costs, and whether the relationships between audit fees/costs and the determinants differ among the large audit firms.

This study contributes to the audit fee literature in several important ways. First, it examines not only audit fees but also audit costs in terms of audit team size (i.e., the number of audit team staff). In Japan, the number of audit team staff has been disclosed in annual reports since 2004. Auditing is a very labor-intensive service. Thus, using the number of audit team staff as a proxy for audit costs, this study examines whether the factors that have been identified as audit fee determinants in prior studies also influence audit costs. For example, prior studies generally determine that audit fees are higher for the more risky clients. However, such higher fees may be the result of the greater effort required to address higher risk or they may be a risk premium for possible future loss (e.g., litigation loss or loss of reputation). Higher fees involve higher costs in the former, but not in the latter case. Examining both audit fees and costs makes it possible to determine which of the possibilities is the case in each audit fee determinant.

Second, this study focuses on the differences in the Japanese Big 3 firms' behavior in determining audit fees and costs. Prior studies examine whether audit pricing by Big N firms is different from that by non-Big N firms and generally find evidence of such differences (i.e., Big N fee premium), but relatively less attention is directed to differences among the large audit firms. There seems to be a

common underlying assumption in prior studies that all Big N firms adopt the same strategy in determining audit fees and costs. The existence of this assumption is evidenced by the fact that most prior studies have not examined the audit fee determinants for each Big N firm separately. Although some studies test whether a particular firm drove its results by repeating analyses using a sample that eliminates the firm's clients, the test is weak as a test of the differences among Big N firms. This study examines the differences among Big N firms more directly.

Third, while prior studies find evidence that audit pricing is influenced by the relationship between an audit firm and its clients (i.e., client bargaining power), the bargaining power is measured solely in terms of absolute and/or relative client size. Client size is one of the important factors that affect the relationship between an audit firm and its clients. However, many other factors that are not reflected in client size affect this relationship, such as a client's social reputation, significance, and presence. To the extent that a company is attractive to an audit firm, and that the firm desires to keep the company in its clientele, the company should have stronger bargaining power over the firm. By considering whether a client is recognized as an excellent company as well as its size, this study refines the findings of prior studies that the relationship between an audit firm and its clients affects audit pricing.

Finally, while many prior studies examine audit pricing issues in the context of the audit market in the U.S., Australia, and some European and Asian countries, only a few studies examine the Japanese audit market (e.g., Taylor 1997; Hayashi et al. 2005; Yazawa 2007). By examining this relatively less studied audit market, this study investigates the extent to which the findings of prior studies can be generalized to another context.

Based on data on the 2006 audits of publicly listed companies conducted by Japanese Big 3 firms, this study finds that although some variables that represent client size, complexity, and risk affect both audit fees and costs, some other client-related and auditor-related variables influence only either audit

fees or costs or have an opposite effect on audit fees and costs. Furthermore, the relationships between audit fees/costs and their determinants vary depending on whether the client is recognized as an excellent company, and they also vary among Big 3 firms, which are considered to reflect the power relations between the audit firms and their clients and the audit pricing/cost strategies of each Big 3 firm.

The remainder of the paper is organized as follows. The next section briefly describes the current conditions of the Japanese audit market. Then related prior studies are reviewed. The subsequent two sections cover the research methodology and empirical results. The final section summarizes the findings and discusses several limitations and implications of the study.

## **BACKGROUND**

Japan has the second largest economy in terms of gross domestic product after the U.S., and the Tokyo Stock Exchange also has the second largest total market value of listed shares. The Japanese capital market has been internationalized in that the percentage of foreign stockholding has consistently increased, and it has been about 28% in recent years.

Since formally introduced in 1957, financial statement audits by certified public accountants (CPAs) have played an important role in the Japanese capital market as in many other developed countries. The Financial Instrument and Exchange Law (the former Securities and Exchange Law) requires financial statements of publicly listed companies to be audited by CPAs. Until 2006, the Japanese audit market was very similar to that in the U.S. and many other countries in that the Big 4 firms (i.e., Azsa, ChuoAoyama, ShinNihon, and Tohmatsu) dominated the market. Each Big 4 firm had an alliance with a U.S. Big 4 firm (Azsa with KPMG, ChuoAoyama with PricewaterhouseCoopers, ShinNihon with Ernst & Young, and Tohmatsu with Deloitte Touche Tohmatsu).

In Japan, a big accounting scandal involving *Kanebo*, a cosmetics company, surfaced in April 2005, and it turned out that ChuoAoyama, the auditor of the company, was involved in it. In May 2006,

the regulatory agency issued a suspension order on ChuoAoyama for its poor quality controls. As a result of the suspension order, ChuoAoyama was unable to provide audit services to its clients for two months; therefore, the clients had to either appoint another audit firm as a temporary auditor or switch to another audit firm. After the penalty, ChuoAoyama changed its name to Misuzu and tried to make a comeback. However, in the end, in February 2007, the firm had to decide to dissolve because of the loss of confidence in society. Some of the former partners of ChuoAoyama, together with PricewaterhouseCoopers, established a new audit firm named Arata in June 2006. However, this firm is still smaller than one-third of the size of the smallest Big 3 firm (Azsa) in terms of the total fees earned for 2007 and the number of CPAs.

Given the current Japanese audit market as described above, this study focuses on audits conducted by the Big 3 firms (i.e., Azsa, ShinNihon, and Tohmatsu) and excludes those conducted by ChuoAoyama and its successors. Since data on the 2006 audits of publicly listed companies are used in this study, I also exclude audits that a Big 3 firm conducted jointly with another firm, and those in which a Big 3 firm served as a temporary auditor to eliminate any possible effects of the ChuoAoyama demise.

Table 1 provides the market shares of the Japanese Big 3 firms in each of the 33 industries according to the *Securities Identification Code Committee*. Panel A presents the number of clients of the Big 3 firms (and other firms) and their market shares based on the number of clients. Out of 3,938 publicly listed companies, Azsa has 703 clients (17.9%), ShinNihon has 873 clients (22.2%), and Tohmatsu has 912 clients (23.2%). The total market share of the Big 3 firms is 63.2%. The market share of ChuoAoyama (and its successors) is about 19%, which is included as “Others.” Azsa has more than 20% market share in 13 industries, more than 25% market share in 2 industries, and is the market leader in 7 industries. ShinNihon has more than 20% market share in 24 industries, more than 25% market share in 10 industries, and is the market leader in 14 industries. Tohmatsu has more than 20% market share in 17 industries, more than 25% market share in 9 industries, and is the market leader in 18

industries (and has no client in 3 industries). The mean industry market shares of Azsa, ShinNihon, and Tohmatsu are 19.2%, 24.7%, and 19.2%, respectively. These data show that Tohmatsu specializes in particular industries to a greater extent than Azsa.

**[Table 1 about here]**

Panel B of Table 1 presents the market shares of the Big 3 firms based on audit fees. Azsa has 22.2% market share in total, has more than 20% market share in 14 industries, and is the market leader in 12 industries. ShinNihon has 28.0% market share in total, has more than 20% market share in 21 industries, and is the market leader in 15 industries. Tohmatsu has 22.0% market share in total, has more than 20% market share in 13 industries, and is the market leader in 6 industries.

Given that the total market share based on audit fees of the Big 3 firms (72.2%) is higher than the total market share based on the number of clients, audit fees per client for the Big 3 firms are higher than those for other firms. In addition, while the market share based on audit fees is higher than the market share based on the number of clients in 25 industries for Azsa, and 21 industries for ShinNihon, it is true for Tohmatsu in only 12 industries. This indicates that audit fees per client for Tohmatsu are lower than those for Azsa and ShinNihon.

## **LITERATURE REVIEW**

Prior audit fee studies have employed similar models based on the Simunic (1980) model with some additions or refinements. This study also adopts the model used in many studies, in which audit fees are modeled as a function of client size, complexity, risk, other client-related factors, and auditor-related factors. In addition, this study applies the audit fee model to the analysis of audit costs.

### **Audit Fees and Costs**

Many studies has been conducted to examine audit fees and fee determinants (for a review, see

Hay et al. 2006). However, very little attention has been paid to audit costs in audit fee research, partly because of the unavailability of audit cost data. Although some studies, such as O’Keefe et al. (1994), Stein et al. (1994), and Hakenbrack and Knechel (1997), examine audit costs in terms of audit hours as well as audit fees, they use proprietary data obtained from one audit firm and it is not clear to what extent their results are generalizable to other firms. Bedard and Johnstone (2004) also examine both audit fees and costs. However, since their primary focus is on audit planning decisions, they use planned audit hours and planned billing rate rather than the actual ones. In Japan, since 2004, not only audit fees but also the number of audit team staff is disclosed in annual reports. Using this unique data on the number of audit team staff as a proxy for audit costs, this study investigates both audit fees and audit costs.

### ***Client Size and Complexity***

It is generally expected that when the client is larger and more complex, then the audit fees and costs are also higher. This expectation is well supported by many audit fee studies (see Hay et al. 2006) and audit production studies (e.g., O’Keefe et al. 1994; Stein et al. 1994; Hakenbrack and Knechel 1997). That is, when a client is larger or more complex, more audit effort is necessary to conduct the audit, and this leads to higher costs. As a result, audit fees are higher to compensate for the higher costs. This relationship between client size/complexity and audit fees/costs is considered to hold true for all audit firms regardless of their audit pricing and cost strategies.

### ***Client Risk***

Many prior studies examine the effects on audit fees of client risk factors such as quick ratio, ROA (ROI), the ratio of long-term debt (or liabilities) to total assets, and whether the client reported a loss in any of the past few years, and they generally find evidence of a positive association between audit fees and client risk (see Hay et al. 2006).

However, some studies on audit planning decisions, using data from working papers, find that

audit planning decisions do not necessarily reflect auditors' risk assessments, and that the relationships between the planning decisions and the assessed client risks are moderate (e.g., Mock and Wright 1999). These findings suggest that even if client risk is higher, the higher risk may not result in higher costs (more effort) in order to respond to the risk. As Simunic (1980) suggests, when auditors identify higher client risk, they may respond to the risk by increasing audit effort and, as a result, raising audit fees, or they may raise audit fees only as a risk premium to cover possible future loss (e.g., litigation loss or loss of reputation). Which of these two possibilities is the case is an empirical issue, and it depends largely on the audit firm's pricing and cost strategies.

### ***Other Client-Related Factors***

Some other client characteristics may also affect audit fees and costs. This study examines three client-related variables: whether the client is a SEC registrant, whether the client has its headquarters in Tokyo, and whether the fiscal year ends in a busy season.

If the client is a SEC registrant, its audit fees are expected to be higher. For example, Mayhew and Wilkins (2003) find that the fees associated with IPOs are higher when the IPOs involve ADRs. For a SEC registrant client, the audit firm may have to undertake more audit work to adapt the financial statements to the U.S. GAAP, and to ensure that they comply with other additional regulations. In addition, the audit firm may charge a risk premium on the client because the U.S. is much more litigious than Japan (Wingate 1997) and the litigation risk for an audit firm is much higher when the client is a SEC registrant.

Some prior studies find that client (and auditor) location also affects audit fees. Basioudis and Francis (2007) and Beattie et al. (2001) find that in the U.K. market, the audit fee is higher when the client is a London-based company or when the auditor is located in London. In Japan, the degree of company concentration is much higher than in other countries. As stated later (see Table 2), in the sample of this study, 48% of the companies have their headquarters in Tokyo, whereas 39% of the

companies listed on the London Stock Exchange are London-based companies in the U.K. market (Basioudis and Francis 2007), 37% of publicly listed companies are in Sydney in the Australian market (Ferguson et al. 2003), and only 50% of publicly listed companies are in the 10 largest cities in the U.S. market (Francis et al. 1999). Given the higher company concentration in Tokyo, audit fees and costs are expected to be higher for those clients that have their headquarters in Tokyo than for other clients.

Similarly, if the fiscal year end is concentrated in a particular season (or day), audit fees and costs are expected to be higher in the busy season (see Hay et al. 2006).<sup>1</sup> Given that 71% of the sample companies in this study have a fiscal year that ends on March 31, both audit fees and costs are expected to be higher for these companies than for other companies that have a non-March 31 year end.

### ***Auditor-Related Factors***

In relatively recent audit fee studies, much attention has been paid to the effect of auditor-related factors, such as audit market concentration, auditors' industry specialization, and the auditor-client relationship (i.e., bargaining power), on audit fees.

Prior studies provide mixed results on whether higher audit market concentration results in higher audit fees. Pearson and Trompeter (1994) find that audit fees are lower after switching auditors when the auditors before and after the switching are both market leaders, where the market leaders are defined as the three audit firms that have the largest market share in the industry, and they conclude that there is strong competition among the market leader audit firms. Pong and Burnett (2006) examine the effect of the PricewaterhouseCoopers merger and find that the higher audit market concentration caused by the merger does not result in higher audit fees. On the contrary, Feldman (2006) finds evidence of higher market concentration measured by the Herfindahl-Hirschman Index results in higher audit fees.

Craswell et al. (1995) find that industry specialist Big 8 firms, defined as having at least 10%

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<sup>1</sup> However, some studies, such as Craswell et al. (1995) and Ferguson et al. (2003), do not find evidence of this positive association in the Australian context.

market share in the industry, earn higher fees than non-specialist Big 8 firms. In addition, the industry specialization fee premium is greater for larger company clients (Ferguson and Stokes 2002; Ferguson et al. 2003; Carson and Fargher 2007).<sup>2</sup> Casterella et al. (2004) examine the relationship between auditors' industry specialization and client bargaining power, and they find that if the client has a larger bargaining power, audit fees are lower and there is no fee premium for industry specialization. In their study, however, client bargaining power is measured in terms of absolute and relative client size. Mayhew and Wilkins (2003) find that although audit fees are negatively associated with auditors' market share in industries in which no audit firm has differentiated itself from the other firms, an audit firm that has differentiated itself from other firms earns higher fees.

Consistent with Casterella et al. (2004) and Mayhew and Wilkins (2003), this study focuses on audit firms' industry market share, audit firms' differentiation, and client bargaining power. As the industry market share of an audit firm is higher, the firm can develop expertise in the industry and provide a more efficient audit. That is, audit costs in industries with a higher market share are expected to be lower. However, how a higher market share affects audit fees depends on client bargaining power and audit pricing strategy of the audit firm. On the other hand, if an audit firm differentiates itself from other firms, the differentiated firm is expected to be able to exert monopoly power and enjoy higher audit fees regardless of client bargaining power.

As stated above, client bargaining power is measured solely in terms of client size. However, client bargaining power over the audit firm is considered to be influenced by many other factors. To the extent that a client is attractive to the audit firm, and the firm desires to keep the client in its clientele, the client has stronger bargaining power over the firm. Such client attractiveness should be influenced

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<sup>2</sup> In addition, Ferguson et al. (2003) find that audit pricing is generally based on office-level specialization rather than firm-level specialization. Azsa, ShinNihon, and Tohmatsu have 24, 35, and 38 domestic offices, respectively, including headquarters. However, which office conducts a particular audit is not disclosed in audit reports or elsewhere in Japan. Therefore, it is difficult to examine office-level specialization and this study focuses on firm-level specialization only.

by the client's social reputation, significance, and presence, as well as its size. Thus, in addition to a size-based criterion, this study distinguishes clients that have strong bargaining power over the audit firm from clients that do not, based on whether a client is listed in the *Nikkei Excellent Company Ranking 1000*. The *Nikkei Excellent Company Ranking 1000* is published annually by Nihon Keizai Shimbun Inc. (a major financial press in Japan), and the results are determined using four factors (size, profitability, safety including liquidity, and growth potential) extracted from 15 financial variables that are selected based on a questionnaire survey to its correspondents. In this study, the companies included in the ranking are designated as *excellent companies* that are considered to have strong bargaining power and companies not included in the ranking are designated as *non-excellent companies* whose bargaining power is not strong.

### **Differences in Audit Pricing and Cost Strategies among Big 3 Firms**

Many prior studies examine whether audit fees differ between the large audit firms (i.e., Big N firms) and other firms and they find evidence of a fee premium for the large firms (e.g., Francis and Stokes 1986; Carson et al. 2004). However, whether there are any differences in audit fees/costs and their determinants among the large audit firms has not been thoroughly examined. Most prior studies seem to have an important assumption in common: the large audit firms adopt the same strategies on audit fees/costs, client acquisition and portfolio, the audit quality they provide, and risk preference. The existence of this assumption is evidenced by the fact that the analyses in the studies are conducted using a sample in which the clients of the large firms are pooled.

Whether an audit firm responds to client higher risk by increasing its audit effort (and, as a result, raising audit fees), or by charging a risk (insurance) premium without increasing audit costs, depends at least partly on the firm's risk preference and the audit quality that the firm intends to attain. In addition, while some firms may seek a higher reputation by expanding market share and developing expertise in

particular industries (Craswell et al. 1995), others may do so by obtaining and maintaining large well-established companies as clients regardless of their industry. For example, it is reported that PricewaterhouseCoopers adopts a strategy that focuses on larger clients in the U.K. (Pong and Burnett 2006) and in Germany (Bigus and Zimmerman 2008). In Japan, the managing partner of Azsa stated that the firm would focus on providing audits to excellent companies that have overseas operations (Nikkei Kin'yu Shimbun 2007). Furthermore, Kealey et al. (2007) report that the mean auditor tenure of Arthur Andersen was longer than that of the other Big 5 firms. Cahan and Zhang (2006) find that Ernst & Young is the most conservative of the Big 4 firms in the audits of ex-Andersen clients. These differences in strategy among the large audit firms should influence audit fees/costs and the associations with their determinants.

In prior studies, differences among the large audit firms are examined by repeating analyses using a sub-sample that excludes the clients of a particular firm (Craswell et al. 1995; Ferguson et al. 2003; Elliot et al. 2008). Although some of these studies find the effect of a particular firm (Elliot et al. 2008), these tests are weak as a test of the differences among the large audit firms. This study examines the differences among the Japanese Big 3 firms more directly by conducting separate analyses of each firm. However, these examinations are descriptive in nature because it is not clear how different the overall strategies of the Big 3 firms are.

## **RESEARCH METHOD**

### **Sample**

The sample used in this study consists of publicly listed companies whose financial statements are audited by any of the Japanese Big 3 firms for the fiscal year 2006 ( $n = 2,488$ ). The sample does not include audits that were conducted jointly with another audit firm and that Big 3 firms served as a temporary auditor to eliminate any possible effects of the ChuoAoyama demise. Companies in the

following financial-related industries are excluded because these industries are highly regulated and audit pricing in them is very different from that in other industries: banks, securities, insurance and other financial business (n = 145).

Data on audit fees and the number of audit team staff for the 2,343 companies are obtained from *2008 Report on Auditor and Audit Fees of Publicly Listed Companies* (Study Group on Auditor and Audit Fee Issues 2008). Financial and other data for the sample companies are collected from *Nikkei NEEDS Financial Data for Listed Companies*. Eighty-three companies are omitted for the lack of necessary financial data, 43 for the lack of audit fees or the number of audit team staff data, and 20 for the fact that 2006 fiscal year did not have 365 days. Thus, the final sample consists of 2,197 companies (619 for Azsa, 769 for ShinNihon, and 809 for Tohmatsu). Of the 2,197 companies, 657 companies are included in *2006 Nikkei Excellent Company Ranking 1000*, and each of them is designated as an excellent company in this study (209 for Azsa, 226 for ShinNihon, and 222 for Tohmatsu).

### **Model Specifications and Variable Definitions**

This study adopts an audit fee regression model that is similar to those used in prior studies. The model includes client size, complexity, risk, other client-related factors, and auditor-related factors that relate to the auditor-client relationship as the determinants of audit fees. In addition, the same set of variables is used to estimate the effects of these factors on the number of audit team staff. Specifically, the following regression models are adopted.

$$\begin{aligned}
 \ln FEE &= \alpha_0 + \alpha_1 \ln ASSETS + \alpha_2 SUBS + \alpha_3 CATA + \alpha_4 Foreign + \alpha_5 Quick \\
 &+ \alpha_6 ROA + \alpha_7 DE + \alpha_8 Loss + \alpha_9 SEC + \alpha_{10} Tokyo + \alpha_{11} YE + \alpha_{12} Share \\
 &+ \alpha_{13} DIFF + \alpha_{14} Power + \varepsilon
 \end{aligned} \tag{1}$$

$$\begin{aligned}
 \ln TEAM &= \beta_0 + \beta_1 \ln ASSETS + \beta_2 SUBS + \beta_3 CATA + \beta_4 Foreign + \beta_5 Quick \\
 &+ \beta_6 ROA + \beta_7 DE + \beta_8 Loss + \beta_9 SEC + \beta_{10} Tokyo + \beta_{11} YE + \beta_{12} Share \\
 &+ \beta_{13} DIFF + \beta_{14} Power + \varepsilon'
 \end{aligned} \tag{2}$$

In Equations (1) and (2), *lnFEE* is the natural log of audit fees paid to the audit firm, and *lnTEAM* is the natural log of the number of the audit team staff, which is the sum of the number of auditors who signed the audit report<sup>3</sup> and the number of CPAs and others who were involved in the audit.

The natural log of total assets (*lnASSETS*) is included as a client size variable, In addition, the square root of the number of consolidated subsidiaries (*SUBS*), the ratio of current assets to total assets (*CATA*), and the ratio of foreign sales to total sales (*Foreign*) are included as independent variables relating to client complexity. These variables regarding client size and complexity are expected to be positively related to both audit fees and costs regardless of the relationships between the audit firm and the client (i.e., whether the client is an excellent company or has strong bargaining power). Thus, the coefficients of these variables are expected to be positive in all models.

To examine how a client's risk affects audit fees and costs, I include four variables: the ratio of quick assets to current liabilities (*Quick*), income before interest and tax divided by total assets (*ROA*), the ratio of long-term debt to total assets (*DE*), and an indicator variable that is equal to 1 if the client reported a loss in any of the past three years (*Loss*). Consistent with Ferguson et al. (2003) and Carson and Fargher (2007), *Quick*, *ROA*, and *DE* are winsorized to a value of  $\pm 3$  standard deviations to eliminate the effects of outliers. Prior studies generally find evidence that a client's higher risk results in higher audit fees. Thus, the coefficients of these variables in Equation (1) are expected to be positive. However, client bargaining power may moderate the effect of these variables. In particular, when the client bargaining power is strong, the audit firm may not be able to respond to a client's higher risk by increasing audit fees. Furthermore, even if a client's higher risk results in higher audit fees, it is not clear whether it involves higher audit costs. Thus, the directions of the coefficients in Equation (2) are not specified.

Three other variables that relate to client characteristics are included. One is an indicator variable

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<sup>3</sup> In Japanese audit practice, each engagement partner signs the audit report.

that is equal to 1 if the client is a SEC registrant (*SEC*). When a client is a SEC registrant, additional audit efforts are necessary and/or the audit is considered riskier. Thus, the coefficient of this variable is expected to be positive in both Equations (1) and (2). The other variables are an indicator variable that is equal to 1 if the headquarters of the client is in Tokyo (*Tokyo*), and an indicator variable that is equal to 1 if the fiscal year end is not March 31 (*YE*). Although some studies find evidence of the effects on audit fees of the client's geographical location and the fiscal year ending in the busy season, it is not clear how these variables affect audit costs in terms of the number of audit team staff.

Three variables that relate to the auditor-client relationship are included. *Share* is the market share of a Big 3 firm in an industry in terms of the number of clients. It is defined as the number of clients of the audit firm divided by the number of companies in the industry, and it is calculated based on the data presented in Table 1. *DIFF* is an indicator variable that examines whether an audit firm that is differentiated from other firms affects audit fees and costs, which is equal to 1 if the audit firm has the largest market share in the industry, and has a market share lead of at least seven percentage points over its closest competitor. This definition is consistent with that used in Mayhew and Wilkins (2003), although they require a ten percentage points market share lead to designate a differentiated firm. This study adopts a seven percentage points market share lead rather than ten percentage points because there are only three large audit firms in the Japanese market, while there were five large audit firms in the Australian audit market as examined by Mayhew and Wilkins (2003). However, this definition of audit firm differentiation is arbitrary and subject to sensitivity analysis. *Power* is the ratio of the natural log of the client's sales to the sum of the logged sales of all clients in the industry audited by the auditor, and it measures the bargaining power of the client over the audit firm (Casterella et al. 2004).

To examine further the effects of client bargaining power on audit fees and costs, this study adopts another criterion: whether the client is recognized as an excellent company. Specifically, I divide the sample into companies that are listed (excellent companies) and those that is not listed

(non-excellent companies) in *2006 Nikkei Excellent Company Ranking 1000*. As stated, the effects of *Share*, *DIFF*, and *Power*, which relate to the relationship between the audit firm and the client on audit fees and costs, are considered to depend on whether the client is recognized as an excellent company.

## Descriptive Statistics

Table 2 provides descriptive statistics of the dependent and independent variables, and Panels A, B, and C describe the full sample, the excellent company sub-sample, and the non-excellent company sub-sample, respectively.

[Table 2 about here]

To examine the differences between the excellent and non-excellent company sub-samples and among the Big 3 audit firms, *t* tests and chi-squared tests are conducted (the results are not reported in the table). The results show significant differences between the excellent and non-excellent company sub-samples for all variables (at the 5% level for *DE* and *Share*, and at the 1% level for other variables). That is, in the excellent company sub-sample, audit fees and costs (*lnFEE*, *lnTEAM*) are higher, and the clients are larger (*lnASSETS*), more complex (*SUBS*, *CATA*), less risky (*Quick*, *ROA*, *DE*), and have stronger bargaining power (*DIFF*, *Power*) than in the non-excellent company sub-sample.

Several interesting differences are found by comparing the Big 3 firms. Based on the full sample (Panel A), *lnFEE* of Tohmatsu is significantly lower than that of Azsa, and *lnTEAM* of Tohmatsu is significantly lower than that of Azsa and ShinNihon at the 1% level. Consistent with these results, *lnASSETS* and *SUBS* of Tohmatsu are significantly lower than those of Azsa and ShinNihon at the 1% level. In addition, the percentage of clients of Tohmatsu that have headquarters in Tokyo (*Tokyo*) is significantly lower than that of Azsa and ShinNihon. On the other hand, *Share* and *DIFF* of Tohmatsu are significantly higher than those of ShinNihon at the 1% level, and those of Azsa are significantly lower than those of the other two firms at the 1% level. Furthermore, *Power* of both ShinNihon and

Tohmatsu is significantly lower than that of Azsa at the 5% and 1% level, respectively. The same tendency is also found for both the excellent and non-excellent company sub-samples (Panels B and C).

In sum, these differences indicate that Tohmatsu has a smaller clientele that is geographically more dispersed but is more specialized in particular industries, and it has stronger bargaining power over its clients than Azsa and ShinNihon. They may reflect differences in strategies among the Big 3 firms. That is, Tohmatsu appears to have a strategy to focus on and develop expertise in particular industries regardless of client size and location, while Azsa places more weight on client size and location than their industry. ShinNihon appears to adopt an in-between strategy. Given these differences, it is important to compare further the relationships between audit fees/costs and their determinants among the Big 3 firms.

Table 3 shows a Pearson correlation matrix. *lnFEE* and *lnTEAM* are significantly positively correlated (0.592). In addition, *Share* and *DIFF* are significantly positively correlated (0.640) and these variables are significantly negatively correlated with *Power* (-0.061 and -0.045, respectively). However, *CATA*, *Loss*, and *YE* are significantly negatively correlated with both *lnFEE* and *lnTEAM*, and *lnFEE* is significantly negatively correlated with *DIFF* and positively correlated with *Power*, which are contrary to expectations. Thus, conducting multivariate analysis is warranted.

**[Table 3 about here]**

## RESULTS

Tables 4 and 5 present the OLS regression results of the models shown in Equations (1) and (2), with Panels A, B, and C describing the full sample, the excellent company sub-sample, and the non-excellent company sub-sample, respectively.<sup>4</sup> The explanatory power of the audit fee model (Equation (1)) is high (adjusted  $R^2 = 76.1\%$  for the full sample), although it is lower for the

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<sup>4</sup> All VIF scores are less than 4.2 and multicollinearity is not a problem in the analyses.

non-excellent company sub-sample than for the excellent company sub-sample (adjusted  $R^2 = 76.3\%$  for the excellent company sub-sample and  $64.7\%$  for the non-excellent sub-sample). This is consistent with the findings of recent prior studies (Ferguson et al. 2003; Mayhew and Wilkins 2003; Casterella et al. 2004). On the other hand, the explanatory power of the audit cost model (Equation (2)) is much lower. Adjusted  $R^2$  is  $35.0\%$  for the full sample,  $38.5\%$  for the excellent company sub-sample, and  $21.0\%$  for the non-excellent company sub-sample.

**[Tables 4 and 5 about here]**

### **Audit Fees and Costs**

Based on the full sample results shown on the left side of Panel A of Tables 4 and 5, the effect of *lnASSETS* on *lnFEE* is positive and significant. As for client complexity variables, *SUBS* and *CATA* have a significant positive effect on *lnFEE*, although the effect of *Foreign* is not significant. Furthermore, *lnASSETS*, *SUBS*, and *CATA* have a significant positive impact on *lnTEAM*. These results indicate that client size and complexity positively affect both audit fees and costs. That is, the larger and more complex a client is, the higher the audit fees and costs are.

Among client risk variables, only *Loss* has a significant positive effect on *lnFEE*, indicating higher fees for clients reporting a loss in any of the past three years. The effect of other risk variables (*Quick*, *ROA*, *DE*) on *lnFEE* is not significant, which is inconsistent with the findings of prior studies (see Hay et al. 2006). In addition, the positive effect of *Loss* on *lnTEAM* is marginally significant. Thus, when a client has reported a loss in any of the past three years, the auditor requires more input for the audit and as a result increases the fees.

As for the other client-related variables, *SEC* has a significant positive effect on both *lnFEE* and *lnTEAM*. These results mean that when a client is a SEC registrant, both audit fees and costs are higher. Estimating the percentage changes in audit fees and costs, according to the method proposed by

Craswell et al. (1995), audit fees are 258% higher and the number of audit team staff is 52% larger. In terms of audit fees, it is very expensive for a company to be a SEC registrant, and the audit fee increase can be interpreted as consisting of both a cost increase and a risk premium. It is interesting that *Tokyo* has a significant positive impact on *lnFEE* but a significant negative impact on *lnTEAM*. These results may reflect the audit pricing and staff assignment strategies of Big 3 firms and further investigation seems necessary. *YE* does not significantly affect *lnFEE*, although its positive effect on *lnTEAM* is marginally significant.

All three variables that relate to the auditor-client relationship (*Share*, *DIFF*, *Power*) have a significant effect on *lnFEE*. *Share* is negatively related to both *lnFEE* and *lnTEAM*. These results support the idea that an audit firm can develop expertise in an industry in which it has a large market share, and that this expertise makes possible more efficient audits in the industry, leading to lower audit costs and fees. *DIFF* has a significant positive impact on *lnFEE* but not on *lnTEAM*. That is, an audit firm that is differentiated from other firms can obtain a fee premium without additional costs. The audit fees of a differentiated firm are 9% higher than those of other firms. Finally, *Power* has a significant negative impact on both *lnFEE* and *lnTEAM*, although the effect on *lnTEAM* is marginal. When a client has stronger bargaining power, the audit firm lowers both audit fees and costs.

The findings described above explain the audit pricing and cost strategies of the Japanese Big 3 firms, but the relationships between audit fees/costs and the determinants may be influenced by the relationship between the audit firm and the client, and may differ among the Big 3 firms. Therefore, it is necessary to examine these relationships in detail.

### **Comparisons between the Excellent Companies and the Non-Excellent Companies**

Panels B and C of Tables 4 and 5 provide the OLS regression results for the excellent and non-excellent company sub-sample, respectively.

There are several noteworthy differences between the excellent and non-excellent company sub-samples. First, for the excellent company sub-sample, *DE* has a marginally significant negative impact on *lnFEE* without influencing *lnTEAM*, whereas it has a significant positive impact on both *lnFEE* and *lnTEAM* for the non-excellent company sub-sample. Although it is not clear why *DE* has a negative impact on *lnFEE* for the excellent company sub-sample, for the non-excellent company sub-sample, audit fees and costs are higher when the ratio of long-term debt is higher (i.e., the client is riskier). Second, *Loss* has a significant positive impact on *lnTEAM* without influencing *lnFEE* for the excellent company sub-sample, whereas it has a significant positive impact on *lnFEE* without influencing *lnTEAM* for the non-excellent company sub-sample. When an excellent company client reports a loss, the audit firm requires more staff to conduct the audit because the potential future losses resulting from an audit failure may be larger, but it cannot raise its audit fees because the bargaining power of the client is stronger. On the other hand, when a non-excellent company client reports a loss, the auditor responds to the risk by raising audit fees without increasing the number of audit team staff (a risk premium), because the client is less significant to the audit firm and the client's bargaining power is weaker.

More importantly, the negative effects of *Share* on *lnFEE* and *lnTEAM* are significant for the non-excellent company sub-sample, but not for the excellent company sub-sample. In other words, an audit firm with a higher market share provides a less costly (more efficient) audit, and lowers audit fees, only for non-excellent company clients. In addition, the positive impact of *DIFF* on *lnFEE* is found only for the non-excellent company sub-sample. An audit firm can obtain a fee premium by differentiating itself from other firms, but only for non-excellent company clients. Furthermore, *Power* has a significant negative impact on *lnFEE* without influencing *lnTEAM* for the excellent company sub-sample, while it affect neither *lnFEE* nor *lnTEAM* for the non-excellent company sub-sample. That is, for excellent company clients, the audit firm has to reduce audit fees without reducing the number of audit team staff

when the client has stronger bargaining power.

In sum, the relationships between audit fees/costs and their determinants vary in many respects depending on whether the client is recognized as an excellent company.

### **Comparisons of Japanese Big 3 firms**

Next I compare the relationships between audit fees/costs and their determinants among Japanese Big 3 firms. Tables 4 and 5 show that there are many specific differences in variables that have a significant effect on the audit fees and costs among Big 3 firms, and it seems difficult to explain all the differences systematically and consistently. Therefore, I focus only on variables that have a significant effect on audit fees and/or costs in the full sample analyses in order to highlight the important differences.<sup>5</sup>

First, *lnASSETS* and *SUBS* consistently affect both *lnFEE* and *lnTEAM* for all firms. In this respect, there is no difference among the Big 3 firms. While *CATA* has a marginally significant effect on both *lnFEE* and *lnTEAM* in the full sample results, except for the effect on *lnTEAM* for Tohmatsu (Panel A of Tables 4 and 5), it is interesting that for the excellent company sub-sample, the effect of *CATA* on *lnFEE* and *lnTEAM* is not significant for any firm (Panel B of Tables 4 and 5). For the non-excellent company sub-sample, *CATA* has a significant positive impact on *lnFEE* only for Azsa and a marginally significant positive effect on *lnTEAM* for Azsa and ShinNihon.

The effect of *Loss* on *lnFEE* is significant for ShinNihon and Tohmatsu but not for Azsa based on the full sample and the non-excellent company sub-sample results. Also, *Loss* has a significant

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<sup>5</sup> To examine whether the set of regression parameters is equal between the large firms, Chow tests were also conducted. For the audit fee model, significant differences are found between Azsa and Tohmatsu and between ShinNihon and Tohmatsu, but not between Azsa and ShinNihon at the 5% level. For the audit cost model, significant differences are found between any two of the Big 3 firms based on the full sample at the 1% level. However, based on the excellent and non-excellent company sub-samples, the difference between Azsa and ShinNihon is not significant at the 5% level. In addition, the difference between Azsa and Tohmatsu is not significant at the 5% level based on the excellent company sub-sample.

positive effect on *lnTEAM* for ShinNihon (the full sample and the non-excellent company sub-sample) and Azsa (the excellent company sub-sample).

Although the effect of *SEC* on *lnFEE* is significant for all firms, it is notable that the effect on *lnTEAM* is not significant for ShinNihon. Similarly, the effect of *Tokyo* on *lnFEE* is positive and significant for all firms. However, the effect on *lnTEAM* is positive and significant for Azsa (the non-excellent company sub-sample) and ShinNihon (the full sample and the non-excellent company sub-sample), but it is negative and significant for Tohmatsu (the full sample and the sub-samples). The reason for this difference is not clear, but it may be related to the geographical dispersion of the clientele of Tohmatsu and its industry specialization orientation as stated above.

*Share* has a significant negative impact on *lnFEE* for Azsa (the full sample and the excellent company sub-sample) and ShinNihon (the full sample and the non-excellent company sub-sample), but it has only a marginally significant positive impact on *lnFEE* for Tohmatsu (the excellent company sub-sample). The effect of *Share* on *lnTEAM* is negative and significant only for Azsa (the non-excellent company sub-sample). In addition, *DIFF* has a significant positive effect on *lnFEE* only for Tohmatsu (the non-excellent company sub-sample), while the effect on *lnTEAM* is not significant for any firm. Furthermore, the negative impact of *Power* on *lnFEE* is significant only for Tohmatsu (the full sample and the excellent company sub-sample) and its negative impact on *lnTEAM* is significant only for ShinNihon (the full sample and the non-excellent company sub-sample). These results indicate that the relationships between audit fees/costs and the determinants vary considerably among firms and the differences in the relationships may reflect the differences in audit pricing and cost strategies.

Although there are some other differences (e.g., the effect of *Quick* on *lnFEE* is significant only for ShinNihon, and the effects of *DE* and *ROA* on *lnFEE* are significant only for Tohmatsu), explaining all the differences in a consistent manner is beyond the scope of this study. Future research should pursue the development of a theoretical framework to explain these differences in relation to each firm's

audit pricing and cost strategies.

## **Sensitivity Analyses**

### ***Alternative Definition of Audit Firm's Differentiation***

In the above analyses, an audit firm is designated as differentiated from other firms when the firm has the largest market share in the industry, and has a market share lead at least seven percentage points over its closest competitor. This definition of differentiation (i.e., the seven percentage points market share lead) is arbitrary, and thus the analyses are repeated using alternative thresholds. When the 10% market share lead is adopted, as in Mayhew and Wilkins (2003), the results on the effect of *DIFF* on audit fees and costs do not differ significantly. However, when a 5% market share lead is adopted as the threshold of differentiation, the effect of *DIFF* on audit fees is not significant for any sample, although its negative effect on audit costs is significant at the 5% level for the excellent company sub-sample. The latter results imply that a low market share lead such as 5% is not enough to differentiate one audit firm from other audit firms.

### ***Effect of Non-Audit Fees***

Some prior studies, such as Simunic (1980) and Yazawa (2007), find evidence of a positive association between audit and non-audit fees. The effect of non-audit fees is not examined in the above models (Equations (1) and (2)). As in Craswell et al. (1995), two sensitivity tests were conducted using total fees (the natural log of the sum of audit and non-audit fees) as a dependent variable, and by including non-audit fees (the natural log of non-audit fees) as an independent variable, to examine the effect of non-audit fees.

When total fees are used as a dependent variable, the results are not significantly different from those reported. On the other hand, when non-audit fees are included as an independent variable, the effect of the variable on audit fees is positive and significant at the 1% level for any sample, which is

consistent with the findings of prior studies. However, the effect on audit costs is not significant for any sample.

### ***Effect of SEC registrants***

As stated above, when a client is a SEC registrant, audit fees are 258% higher and the number of audit team staff is 52% larger than for non-SEC registrants. The increase in audit fees and costs is very large and the reported results may be driven primarily by the outliers. To eliminate the possible effects of the outliers, the regression models were re-estimated using samples that exclude SEC registrants. The results do not significantly differ from those reported above.

### ***Effect of Small Industries***

Finally, since the definitions of the three auditor-related variables (i.e., *Share*, *DIFF*, and *Power*) are industry-based, the variables may be influenced by the industry size. In particular, Craswell and Taylor (1991) and Craswell et al. (1995) report that, in industries with less than 30 companies, a reliable indicator for an audit firm's industry specialization cannot be obtained. Thus, I repeated the analyses using samples that exclude clients in the 8 industries that have less than 30 companies (i.e., Fisheries/Agriculture, Mining, Pulp/Paper, Oil/Coal Products, Rubber Products, Electricity/Gas, Marine Transportation, Air Transportation; see Table 1 Panel A).

The results regarding the effect of *Power* are significantly different from those reported. That is, the negative effect of *Power* on audit fees is significant for the non-excellent company sub-sample at the 1% level, as well as for the full sample and the excellent company sub-sample, and its negative effect on audit costs is significant for the full sample and the non-excellent company sub-sample at the 1% level. These results indicate that when the client bargaining power is stronger, audit fees are lower irrespective of whether the client is an excellent company. However, although the lower fees involve lower costs for non-excellent company clients, the stronger client bargaining power does not affect audit costs when the client is an excellent company. There is no other significant difference.

## DISCUSSION AND CONCLUSION

This study investigates how the audit fee determinants examined in many prior studies affect audit costs in terms of the number of audit team staff and audit fees in the context of the Japanese audit market. In addition, this study examines how different the audit pricing and cost strategies among Japanese Big 3 firms are. Using data on 2006 audits of publicly listed companies, it is found that in an aggregate, many variables such as client size, complexity, whether the client experienced a loss in any of the past three years, whether the client is a SEC registrant, the firm's market share in the industry, and client bargaining power, influence both audit fees and costs in the same direction. On the other hand, some variables, such as whether the fiscal year ends in the busy season, whether the client's headquarters is in Tokyo, and whether the audit firm is differentiated in the industry, affect only either audit fees or costs, or affect audit fees and costs, but in opposite directions. Furthermore, this study finds that these relationships between audit fees/costs and the determinants vary widely depending on whether the client is recognized as an excellent company, and they also vary among the Big 3 firms.

Prior studies on audit fees have not fully examined whether the various factors that affect audit fees also influence audit costs, or whether audit pricing and cost strategies are different among the large audit firms, but this study provides evidence on these issues. In particular, the finding of this study that there are differences in the relationships between audit fees/costs and the determinants among the Japanese Big 3 firms implies that it is necessary for future research to consider such differences among the large audit firms, and to develop a theoretical framework to explain the differences in relation to the audit pricing and cost strategies of each audit firm.

Several limitations should be borne in mind when interpreting the results of this study. First, this study adopts the number of audit team staff (i.e., the audit team size) as a proxy for audit costs.

Although this is considered an appropriate proxy for audit costs, given that auditing is a labor-intensive

service, it may involve a measurement error. That is, it may not reflect the total audit efforts (e.g., audit hours) necessary to conduct the audit. However, given the very limited availability of audit cost data, I believe it is the best available proxy.

In addition, as stated above, the Japanese audit market experienced a drastic change in 2006 when one of the Big 4 firms dropped out of the market. Since then, the market concentration of the remaining large firms has increased and a new audit firm, Arata, which is allied with PricewaterhouseCoopers, has been established. Due to these changes, the results of this study may not be generalizable to the current market. It is important for future research to continue examining whether the changes in the Japanese audit market have resulted in any changes in the audit pricing and cost strategies of each of the large audit firms. Furthermore, it would be interesting to investigate whether differences in audit pricing and cost strategies similar to those found among Japanese large firms are also found among the Big 4 firms in the U.S. and other countries, and whether the strategies of each Japanese large firm are consistent with those of its allied U.S. Big 4 firm.

## REFERENCES

- Basioudis, I. G., and J. R. Francis. 2007. Big 4 audit fee premiums for national and office-level industry leadership in the United Kingdom. *Auditing: A Journal of Practice & Theory* 26(November): 143 – 166.
- Bedard, J. C., and K. M. Johnstone. 2004. Earnings manipulation risk, corporate governance risk, and auditors' planning and pricing decisions. *The Accounting Review* 79(2): 277 – 304.
- Beattie, V., A. Goodacre, K. Pratt, and J. Stevenson. 2001. The determinants of audit fees – evidence from the voluntary sector. *Accounting and Business Research* 31(4): 243 – 274.
- Bigus, J., and R. –C. Zimmerman. 2008. Non-audit fees, market leaders and concentration in the German audit market: A descriptive analysis. *International Journal of Auditing* 12(November): 159 – 179.
- Cahan, S. F., and W. Zhang. 2006. After Enron: Auditor conservatism and ex-Andersen clients. *The Accounting Review* 81(January): 49 – 82.
- Carson, E., and N. Fargher. 2007. Note on audit fee premiums to client size and industry specification. *Accounting and Finance* 47(3): 423 – 446.
- Carson E., N. Fargher, D. T. Simon, and M. H. Taylor. 2004. Audit fees and market segmentation: Further evidence on how client size matters within the context of audit fee models. *International Journal of Auditing* 8(1): 79 – 91.
- Casterella, J. R., J. R. Francis, B. L. Lewis, and P. L. Walker. 2004. Auditor industry specialization, client bargaining power, and audit pricing. *Auditing: A Journal of Practice & Theory* 23(March): 123 – 140.
- Craswell, A. T., and S. L. Taylor. 1991. The market structure of auditing in Australia: The role of industry specialization. *Research in Accounting Regulation* 5: 55 – 77.
- Craswell, A. T., J. R. Francis, and S. L. Taylor. 1995. Auditor brand name reputations and industry specializations. *Journal of Accounting and Economics* 20(December): 297 – 322.
- Elliot J. A., A. Ghosh, and E. P. Wagner. 2008. Pricing of risky initial audit engagement. Paper presented at the 2008 Illinois Symposium on Audit Research.
- Feldman, E. R. 2006. A basic quantification of the competitive implications of the demise of Arthur Andersen. *Review of Industrial Organization* 29(November): 193 – 212.

- Ferguson, A., and D. Stokes. 2002. Brand name audit pricing, industry specialization, and leadership premiums post-Big 8 and Big 6 mergers. *Contemporary Accounting Research* 19(Spring): 77 – 110.
- Ferguson, A., J. R. Francis, and D. J. Stokes. 2003. The effects of firm-wide and office-level industry expertise on audit pricing. *The Accounting Review* 78(April): 429 – 448.
- Francis J. R., D. J. Stokes, and D. Anderson. 1999. City markets as a unit of analysis in audit research and the re-examination of Big 6 market shares. *Abacus* 35(2): 185 – 206.
- Hackenbrack, K., and W. R. Knechel. 1997. Resource allocation decisions in audit engagements. *Contemporary Accounting Research* 14(3): 481 – 499.
- Hay, D. C., W. R. Knechel, and N Wong. 2006. Audit fees: A meta-analysis of the effect of supply and demand attributes. *Contemporary Accounting Research* 23(Spring): 141 – 191.
- Hayashi, T., Y. Machida, and Y. Matsumoto. 2005. The current status of audit fee disclosure in Japan (*Wagakuni kansahoushu no kaiji jittai*). *Shukan Keiei Zaimu* 2723: 24 – 37. (in Japanese)
- Kealey, B. T., H. Y. Lee, and M. T. Stein. 2007. The association between audit-firm tenure and audit fee paid to successor auditors: Evidence from Arthur Andersen. *Auditing: A Journal of Practice & Theory* 26(November): 95 – 116.
- Mayhew, B. W., and M. S. Wilkins. 2003. Audit firm industry specialization as a differentiation strategy: Evidence from fees charged to firms going public. *Auditing: A Journal of Practice & Theory* 22(September): 33 – 52.
- Mock, T., and A. Wright. 1999. Are audit program plans risk-adjusted? *Auditing: A Journal of Practice & Theory* 18(Spring): 55 – 74.
- Nikkei Kin'yu Shimbun. 2007. *Listen to the Tops of Audit Firms 1(Kansahoujin Top ni Kiku 1)*. Nikkei Kin'yu Shimbun: August 23. (in Japanese)
- O'Keefe, T. B., D. A. Simunic, and M. T. Stein. 1994. The production of audit services: Evidence from a major public accounting firm. *Journal of Accounting Research* 32(2): 241 – 261.
- Pearson, T., and G. Trompeter. 1994. Competition in the market for audit services: The effect of supplier concentration on audit fees. *Contemporary Accounting Research* 11(Summer): 115 – 135.
- Pong, C. K. M., and S. Burnett. 2006. The implications of merger for market share, audit pricing and non-audit fee income: The case of PricewaterhouseCoopers. *Managerial Auditing Journal* 21(1): 7 – 22.

- Simunic, D. A. 1980. The pricing of audit services: Theory and evidence. *Journal of Accounting Research* 18(Spring): 161 – 190.
- Stein, M. T., D. A. Simunic, and T. B. O’Keefe. 1994. Industry differences in the production of audit services. *Auditing: A Journal of Practice & Theory* 13(Supplement): 128 – 142.
- Study Group on Auditor and Audit Fee Issues (*Kansanin Kansahoushu Mondai Kenkyukai*). 2008. *2008 Report on Auditor and Audit Fees of Publicly Listed Companies (Joujoukigyo Kansanin Kansahoushu Hakusho)*. Seibunsha. (in Japanese)
- Taylor, M. H. 1997. The market for audit services in Japan. *Pacific Accounting Review* 9(2): 59 – 74.
- Wingate, M. 1997. An examination of cultural influence on audit environments. *Research in Accounting Regulation*, 11 (Supplement 1): 129 – 148.
- Yazawa, K. 2007. Relationship between audit and non-audit fees (*Kansahoushu to hikansahoushu no kanrensei*). *Accounting Progress* 8: 93 – 105. (in Japanese)

**Table 1**  
**2006 Japanese Audit Market and Big 3 Market Shares Based on the Number of Companies and Audit Fee**

*Panel A: Number of Clients of Big 3 Firms by Industry (percentage of the number of clients in parenthesis)*

<b>Securities Identification Code Committee's Industry</b>	<b>Azsa</b>	<b>ShinNihon</b>	<b>Tohmatsu</b>	<b>Others</b>	<b>Total</b>
Fisheries/Agriculture	2 (18.2)	2 (18.2)	2 (18.2)	5 (45.5)	11
Mining	1 (14.3)	4 (57.1)	0 ( 0.0)	2 (28.6)	7
Construction	39 (17.7)	53 (24.1)	40 (18.2)	88 (40.0)	220
Food	25 (16.0)	34 (21.8)	41 (26.3)	56 (35.9)	156
Fiber Products	18 (22.5)	19 (23.8)	15 (18.8)	28 (35.0)	80
Pulp/Paper	3 (10.3)	7 (24.1)	9 (31.0)	10 (34.5)	29
Chemical	35 (16.0)	57 (26.0)	44 (20.1)	83 (37.9)	219
Pharmaceutical	10 (19.2)	9 (17.3)	12 (23.1)	21 (40.4)	52
Oil/Coal Products	3 (21.4)	4 (28.6)	0 ( 0.0)	7 (50.0)	14
Rubber Products	5 (23.8)	4 (19.0)	2 ( 9.5)	10 (47.6)	21
Steel	10 (17.5)	13 (22.8)	9 (15.8)	25 (43.9)	57
Grass/Ceramic Products	14 (19.4)	16 (22.2)	20 (27.8)	22 (30.6)	72
Nonferrous	9 (20.9)	12 (27.9)	6 (14.0)	16 (37.2)	43
Metal Products	15 (15.0)	17 (17.0)	21 (21.0)	47 (47.0)	100
Machinery	49 (19.6)	49 (19.6)	47 (18.8)	105 (42.0)	250
Electric Machine	55 (17.5)	75 (23.8)	75 (23.8)	110 (34.9)	315
Transportation Equipment	18 (16.8)	23 (21.5)	22 (20.6)	44 (41.1)	107
Precision Equipment	11 (20.8)	11 (20.8)	14 (26.4)	17 (32.1)	53
Other Products	24 (20.3)	17 (14.4)	20 (16.9)	57 (48.3)	118
Electricity/Gas	5 (20.0)	7 (28.0)	5 (20.0)	8 (32.0)	25
Land Transportation	16 (23.9)	22 (32.8)	11 (16.4)	18 (26.9)	67
Marine Transportation	2 (11.1)	9 (50.0)	2 (11.1)	5 (27.8)	18
Air Transportation	2 (33.3)	2 (33.3)	0 ( 0.0)	2 (33.3)	6
Warehouse Transport	13 (28.9)	9 (20.0)	7 (15.6)	16 (35.6)	45
Information/Communication	53 (14.6)	80 (22.0)	91 (25.1)	139 (38.3)	363
Wholesale	74 (19.0)	79 (20.3)	104 (26.7)	133 (34.1)	390
Retail	63 (16.1)	79 (20.2)	127 (32.5)	122 (31.2)	391
Banks	22 (22.2)	38 (38.4)	22 (22.2)	17 (17.2)	99
Securities	8 (20.0)	9 (22.5)	7 (17.5)	16 (40.0)	40
Insurance	3 (27.3)	2 (18.2)	3 (27.3)	3 (27.3)	11
Other Financial Business	7 (11.9)	10 (16.9)	14 (23.7)	28 (47.5)	59
Real Estate	25 (18.9)	33 (25.0)	23 (17.4)	51 (38.6)	132
Services	64 (17.4)	68 (18.5)	97 (26.4)	139 (37.8)	368
<b>Total</b>	<b>703 (17.9)</b>	<b>873 (22.2)</b>	<b>912 (23.2)</b>	<b>1,450 (36.8)</b>	<b>3,938</b>

(continued on next page)

*Panel B: Market Shares of Big 3 Firms by Industry based on Audit Fees (%)*

<b>Securities Identification Code</b>			
<b>Committee's Industry</b>	<b>Azsa</b>	<b>ShinNihon</b>	<b>Tohmatsu</b>
Fisheries/Agriculture	26.8	37.7	8.4
Mining	13.3	64.9	0.0
Construction	19.1	23.7	19.2
Food	19.2	26.5	26.9
Fiber Product	26.4	28.5	20.0
Pulp/Paper	19.6	34.2	19.8
Chemical	17.3	27.4	22.3
Pharmaceutical	19.2	20.5	30.8
Oil/Coal Product	23.7	16.7	0.0
Rubber Product	34.7	19.9	17.3
Steel	14.5	29.3	9.9
Grass/Ceramic Product	26.0	24.2	25.7
Nonferrous	30.9	26.8	11.3
Metal Product	16.3	18.7	20.5
Machinery	27.2	21.0	18.4
Electric Machine	19.7	51.2	9.6
Transportation Equipment	43.2	17.6	5.6
Precision Equipment	33.0	18.5	25.7
Other Products	22.5	16.3	16.9
Electricity/Gas	19.3	33.9	22.9
Land Transportation	29.4	33.8	15.0
Marine Transportation	19.1	39.4	20.9
Air Transportation	8.8	83.1	0.0
Warehouse Transport	33.4	17.9	17.4
Information/Communication	26.5	11.5	18.8
Wholesale	22.3	18.0	40.8
Retail	17.3	21.1	30.9
Banks	13.1	36.2	46.3
Securities	8.2	63.9	3.2
Insurance	14.7	9.2	11.8
Other Financial Business	40.0	8.8	19.4
Real Estate	20.3	26.9	17.8
Services	18.4	19.5	27.3
Total	22.2	28.0	22.0

**Table 2**  
**Descriptive Statistics**

*Panel A: Full Sample*

<b>Variables</b>	<b>Pooled Sample (n = 2,197)</b>		<b>Azsa (n = 619)</b>		<b>ShinNihon (n = 769)</b>		<b>Tohmatsu (n = 809)</b>	
	<b>Mean</b>	<b>S.D.</b>	<b>Mean</b>	<b>S.D.</b>	<b>Mean</b>	<b>S.D.</b>	<b>Mean</b>	<b>S.D.</b>
Audit fees (¥ million)	35.37	115.46	43.20	157.34	31.51	70.47	30.32	111.79
Log of audit fees ( <i>lnFEE</i> )	3.09	0.66	3.16	0.76	3.09	0.65	3.04	0.59
Number of audit team staff	14.52	8.06	15.01	8.98	15.44	8.22	13.27	6.94
Log of number of audit team staff ( <i>lnTEAM</i> )	2.57	0.42	2.61	0.41	2.62	0.46	2.50	0.39
Total assets (¥ million)	205,689	814,778	249,293	862,929	214,124	847,344	164,309	740,965
Log of total assets ( <i>lnASSETS</i> )	10.51	1.65	10.65	1.78	10.63	1.63	10.29	1.54
Number of consolidated subsidiaries	16.69	44.69	20.53	52.67	16.75	40.06	13.70	41.96
Square root of subsidiaries ( <i>SUBS</i> )	2.88	2.90	3.20	3.21	2.97	2.82	2.55	2.68
<i>CATA</i>	0.55	0.20	0.56	0.20	0.55	0.20	0.55	0.20
<i>Foreign</i>	0.12	0.21	0.12	0.20	0.12	0.21	0.11	0.21
<i>Quick</i>	1.38	1.18	1.40	1.20	1.31	1.13	1.44	1.20
<i>ROA</i>	0.07	0.06	0.06	0.06	0.07	0.06	0.07	0.07
<i>DE</i>	0.09	0.11	0.10	0.11	0.10	0.11	0.09	0.11
<i>Share</i>	0.22	0.05	0.18	0.03	0.23	0.05	0.24	0.05
<i>Power</i>	0.04	0.06	0.04	0.07	0.04	0.05	0.03	0.05
<b>Indicator variables</b>								
<i>Loss</i>	24%		25%		24%		25%	
<i>SEC</i>	1%		2%		1%		1%	
<i>Tokyo</i>	48%		50%		53%		42%	
<i>YE</i>	29%		27%		25%		35%	
<i>DIFF</i>	12%		2%		6%		24%	

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Panel B: Excellent Company Sub-sample

Variables	Pooled Sample (n = 657)		Azsa (n = 209)		ShinNihon (n = 226)		Tohmatsu (n = 222)	
	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.
Audit fees (¥ million)	65.10	205.55	83.42	263.37	56.15	123.31	56.96	210.18
Log of audit fees ( <i>lnFEE</i> )	3.54	0.80	3.63	0.91	3.54	0.74	3.44	0.73
Number of audit team staff	18.25	11.02	18.66	12.60	19.65	10.51	16.45	9.67
Log of number of audit team staff ( <i>lnTEAM</i> )	2.79	0.45	2.81	0.45	2.86	0.47	2.69	0.43
Total assets (¥ million)	570,862	1,408,609	625,679	1,395,901	581,709	1,475,896	508,212	1,353,207
Log of total assets ( <i>lnASSETS</i> )	11.98	1.52	12.15	1.53	12.07	1.46	11.71	1.55
Number of consolidated subsidiaries	38.90	74.53	43.44	82.37	39.24	66.23	34.27	74.81
Square root of subsidiaries ( <i>SUBS</i> )	4.81	3.97	5.15	4.13	4.95	3.85	4.35	3.93
<i>CATA</i>	0.53	0.19	0.52	0.19	0.54	0.19	0.53	0.19
<i>Foreign</i>	0.20	0.25	0.19	0.25	0.23	0.25	0.18	0.24
<i>Quick</i>	1.55	1.22	1.46	1.11	1.41	1.20	1.77	1.32
<i>ROA</i>	0.09	0.05	0.09	0.05	0.09	0.05	0.10	0.06
<i>DE</i>	0.09	0.11	0.10	0.12	0.09	0.11	0.07	0.11
<i>Share</i>	0.22	0.05	0.18	0.03	0.24	0.06	0.23	0.05
<i>Power</i>	0.05	0.08	0.06	0.10	0.05	0.07	0.05	0.07
<b>Indicator variables</b>								
<i>Loss</i>	6%		6%		5%		6%	
<i>SEC</i>	3%		5%		2%		3%	
<i>Tokyo</i>	54%		54%		63%		44%	
<i>YE</i>	21%		22%		17%		25%	
<i>DIFF</i>	9%		1%		9%		16%	

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Panel C: Non-Excellent Company Sub-sample

Variables	Pooled Sample (n = 1,540)		Azsa (n = 410)		ShinNihon (n = 543)		Tohmatsu (n = 587)	
	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.
Audit fees (¥ million)	21.25	20.98	22.70	29.71	21.26	19.10	20.24	14.15
Log of audit fees ( <i>lnFEE</i> )	2.90	0.48	2.92	0.52	2.90	0.50	2.89	0.44
Number of audit team staff	12.93	5.70	13.15	5.55	13.69	6.29	12.07	5.09
Log of number of audit team staff ( <i>lnTEAM</i> )	2.48	0.37	2.51	0.34	2.53	0.42	2.43	0.34
Total assets (¥ million)	49,898	142,458	57,428	157,873	61,132	182,547	34,247	68,408
Log of total assets ( <i>lnASSETS</i> )	9.89	1.26	9.89	1.36	10.03	1.28	9.75	1.14
Number of consolidated subsidiaries	7.22	13.47	8.86	18.35	7.39	12.39	5.92	9.80
Square root of subsidiaries ( <i>SUBS</i> )	2.05	1.73	2.20	2.00	2.14	1.67	1.87	1.56
<i>CATA</i>	0.56	0.20	0.58	0.20	0.55	0.21	0.56	0.20
<i>Foreign</i>	0.08	0.18	0.08	0.16	0.08	0.18	0.08	0.19
<i>Quick</i>	1.31	1.15	1.38	1.24	1.26	1.10	1.31	1.13
<i>ROA</i>	0.06	0.06	0.05	0.07	0.06	0.06	0.05	0.06
<i>DE</i>	0.10	0.11	0.10	0.11	0.10	0.11	0.09	0.11
<i>Share</i>	0.22	0.05	0.18	0.03	0.22	0.04	0.25	0.05
<i>Power</i>	0.03	0.04	0.04	0.05	0.03	0.04	0.03	0.04
<b>Indicator variables</b>								
<i>Loss</i>	32%		34%		32%		32%	
<i>SEC</i>	0%		0%		0%		0%	
<i>Tokyo</i>	46%		49%		49%		41%	
<i>YE</i>	33%		30%		29%		39%	
<i>DIFF</i>	13%		2%		4%		28%	

Variable Definitions:

*lnFEE* = natural log of audit fees;

*lnTEAM* = natural log of the number of audit team staff;

*lnASSETS* = natural log of total assets;

*SUBS* = square root of the number of consolidated subsidiaries;

*CATA* = current assets / total assets;

*Foreign* = foreign sales / total sales;

*Quick* = quick assets / current liabilities;

*ROA* = income before interest and tax / total assets;

*DE* = long-term debt / total assets;

*Loss* = indicator variable, 1 if loss reported in any of the past three years;

*SEC* = indicator variable, 1 if SEC registrant;

*Tokyo* = indicator variable, 1 if the company's headquarters is in Tokyo;

*YE* = indicator variable, 1 if non-March 31th year end;

*Share* = the number of clients to the number of companies in the industry for each Big 3;

*DIFF* = indicator variable, 1 if the auditor has the largest market share in the industry and if the auditor has a market share lead at least seven percentage points over its closest competitor;

*Power* = ratio of the natural log of company sales to the sum of logged sales of all companies in the industry audited by the company's auditor.

**Table 3**  
**Pearson Correlation Matrix**  
**(n = 2,198)**

	<i>lnFEE</i>	<i>lnTEAM</i>	<i>lnASSETS</i>	<i>SUBS</i>	<i>CATA</i>	<i>Foreign</i>	<i>Quick</i>	<i>ROA</i>	<i>DE</i>	<i>Loss</i>	<i>SEC</i>
<i>lnFEE</i>	1.000										
<i>lnTEAM</i>	0.592**	1.000									
<i>lnASSETS</i>	0.796**	0.549**	1.000								
<i>SUBS</i>	0.776**	0.529**	0.762**	1.000							
<i>CATA</i>	-0.117**	-0.086**	-0.236**	-0.143**	1.000						
<i>Foreign</i>	0.316**	0.201**	0.326**	0.414**	0.061**	1.000					
<i>Quick</i>	-0.192**	-0.157**	-0.278**	-0.186**	0.334**	0.021	1.000				
<i>ROA</i>	-0.023	-0.021	-0.021	-0.017	0.155**	0.115**	0.210**	1.000			
<i>DE</i>	0.181**	0.134**	0.215**	0.218**	-0.414**	-0.034	-0.412**	-0.178**	1.000		
<i>Loss</i>	-0.073**	-0.053 *	-0.176**	-0.109**	-0.004	-0.087 **	-0.064**	-0.445**	0.120**	1.000	
<i>SEC</i>	0.448**	0.278**	0.244**	0.378**	-0.010	0.156**	-0.010	0.029	0.021	-0.041	1.000
<i>Tokyo</i>	0.225**	0.038	0.093**	0.134**	0.143**	0.016	0.051 *	0.045 *	-0.024	0.003	0.034
<i>YE</i>	-0.168**	-0.091**	-0.220**	-0.177**	-0.005	-0.148**	0.025	0.108**	0.032	0.038	-0.041
<i>Share</i>	-0.041	-0.066**	-0.020	-0.038	-0.109**	-0.037	-0.085**	-0.007	0.077**	-0.004	-0.033
<i>DIFF</i>	-0.063**	-0.075**	-0.075**	-0.075**	-0.225**	-0.140**	-0.095**	0.067**	0.131**	-0.021	-0.039
<i>Power</i>	0.169**	0.115**	0.259**	0.263**	-0.190**	0.112**	-0.097**	-0.036	0.146**	-0.066**	-0.019

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	<i>Tokyo</i>	<i>YE</i>	<i>Share</i>	<i>DIFF</i>	<i>Power</i>
<i>Tokyo</i>	1.000				
<i>YE</i>	-0.017	1.000			
<i>Share</i>	0.018	0.040	1.000		
<i>DIFF</i>	-0.022	0.147**	0.640**	1.000	
<i>Power</i>	0.027	-0.080**	-0.061**	-0.045 *	1.000

\*\* , \* : Correlations are significant at the 1% level and the 5% level, respectively (two-tailed).

Variable Definitions:

*lnFEE* = natural log of audit fees;

*lnTEAM* = natural log of the number of audit team staff

*lnASSETS* = natural log of total assets;

*SUBS* = square root of the number of consolidated subsidiaries;

*CATA* = current assets / total assets;

*Foreign* = foreign sales / total sales;

*Quick* = quick assets / current liabilities;

*ROA* = income before interest and tax / total assets;

*DE* = long-term debt / total assets;

*Loss* = indicator variable, 1 if loss reported in any of the past three years;

*SEC* = indicator variable, 1 if SEC registrant;

*Tokyo* = indicator variable, 1 if the company's headquarters is in Tokyo;

*YE* = indicator variable, 1 if non-March 31th year end;

*Share* = the number of clients to the number of companies in the industry for each Big 3;

*DIFF* = indicator variable, 1 if the auditor has the largest market share in the industry and if the auditor has a market share lead at least seven percentage points over its closest competitor;

*Power* = ratio of the natural log of company sales to the sum of logged sales of all companies in the industry audited by the company's auditor.

**Table 4**  
**Audit Fee Regression Models**  
**(Dependent Variable is Natural Log of Audit Fees)**

*Panel A: Full Sample*

Variables	Pooled Sample (n = 2,197)			Azsa (n = 619)			ShinNihon (n = 769)			Tohmatsu (n = 809)		
	Estimate	t-value	p-value*	Estimate	t-value	p-value*	Estimate	t-value	p-value*	Estimate	t-value	p-value*
Intercept	0.516	6.086	0.000	0.850	4.895	0.000	0.485	3.097	0.002	0.392	2.962	0.003
<i>lnASSETS</i>	0.220	31.713	0.000	0.215	16.541	0.000	0.222	17.519	0.000	0.215	21.013	0.000
<i>SUBS</i>	0.066	16.029	0.000	0.062	8.808	0.000	0.073	9.118	0.000	0.072	11.527	0.000
<i>CATA</i>	0.132	3.211	0.001	0.143	1.787	0.074	0.127	1.769	0.077	0.107	1.740	0.082
<i>Foreign</i>	-0.008	-0.216	0.829	0.049	0.661	0.509	-0.010	-0.153	0.879	-0.031	-0.568	0.570
<i>Quick</i>	0.001	0.122	0.903	-0.021	-1.582	0.114	0.027	2.146	0.032	-0.003	-0.310	0.757
<i>ROA</i>	-0.008	-0.063	0.950	-0.243	-0.995	0.320	0.034	0.143	0.886	0.176	0.951	0.342
<i>DE</i>	0.071	0.951	0.342	0.027	0.191	0.848	0.084	0.632	0.528	0.270	2.412	0.016
<i>Loss</i>	0.091	4.888	0.000	0.044	1.255	0.210	0.123	3.739	0.000	0.085	3.098	0.002
<i>SEC</i>	1.273	17.839	0.000	1.719	16.040	0.000	1.036	5.465	0.000	0.697	6.771	0.000
<i>Tokyo</i>	0.166	11.665	0.000	0.172	6.271	0.000	0.169	6.594	0.000	0.169	8.081	0.000
<i>YE</i>	0.005	0.286	0.775	-0.005	-0.162	0.872	0.035	1.144	0.253	-0.041	-1.847	0.065
<i>Share</i>	-0.519	-2.901	0.004	-1.920	-3.353	0.001	-0.994	-2.731	0.006	0.473	1.623	0.105
<i>DIFF</i>	0.086	2.902	0.004	0.106	0.940	0.348	-0.054	-0.675	0.500	0.014	0.420	0.675
<i>Power</i>	-0.430	-3.370	0.001	0.017	0.084	0.933	0.174	0.659	0.510	-0.998	-4.319	0.000
Adjusted R <sup>2</sup>	76.1%			81.3%			73.0%			76.4%		
F-ratio (p-value)	499.1 (.000)			192.6 (.000)			149.3 (.000)			187.8 (.000)		

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Panel B: Excellent Company Sub-sample

Variables	Pooled Sample (n = 657)			Azsa (n = 209)			ShinNihon (n = 226)			Tohmatsu (n = 222)		
	Estimate	t-value	p-value*	Estimate	t-value	p-value*	Estimate	t-value	p-value*	Estimate	t-value	p-value*
Intercept	-0.025	-0.109	0.913	0.638	1.383	0.168	-0.202	-0.475	0.635	-0.121	-0.361	0.718
<i>lnASSETS</i>	0.269	15.068	0.000	0.259	7.588	0.000	0.281	8.350	0.000	0.246	9.604	0.000
<i>SUBS</i>	0.060	8.757	0.000	0.061	5.303	0.000	0.054	3.937	0.000	0.071	6.811	0.000
<i>CATA</i>	0.167	1.745	0.081	0.122	0.686	0.493	0.143	0.852	0.395	0.019	0.119	0.905
<i>Foreign</i>	-0.119	-1.673	0.095	0.016	0.121	0.904	-0.088	-0.727	0.468	-0.145	-1.223	0.223
<i>Quick</i>	0.005	0.352	0.725	-0.026	-0.833	0.406	0.051	2.024	0.044	-0.003	-0.171	0.864
<i>ROA</i>	0.051	0.156	0.876	-0.349	-0.533	0.595	-0.554	-0.944	0.346	0.834	1.763	0.079
<i>DE</i>	-0.342	-1.912	0.056	-0.395	-1.185	0.237	0.017	0.049	0.961	0.166	0.572	0.568
<i>Loss</i>	-0.016	-0.243	0.808	0.070	0.552	0.582	0.030	0.232	0.817	-0.087	-0.883	0.378
<i>SEC</i>	1.267	12.924	0.000	1.644	10.568	0.000	1.087	4.735	0.000	0.705	4.842	0.000
<i>Tokyo</i>	0.158	4.989	0.000	0.125	2.116	0.036	0.160	2.758	0.006	0.154	3.192	0.002
<i>YE</i>	0.031	0.781	0.435	0.047	0.649	0.517	0.048	0.646	0.519	-0.068	-1.153	0.250
<i>Share</i>	-0.419	-1.134	0.257	-3.190	-2.593	0.010	-0.352	-0.534	0.594	1.404	1.966	0.051
<i>DIFF</i>	-0.041	-0.580	0.562	-0.009	-0.032	0.974	-0.257	-1.700	0.091	-0.112	-1.304	0.194
<i>Power</i>	-0.589	-2.835	0.005	-0.042	-0.140	0.889	-0.382	-0.885	0.377	-1.586	-3.582	0.000
Adjusted R <sup>2</sup>	76.2%			80.2%			72.7%			78.3%		
F-ratio (p-value)	150.9 (.000)			61.1 (.000)			43.9 (.000)			58.0 (.000)		

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Panel C: Non-Excellent Company Sub-sample

Variables	Pooled Sample (n = 1540)			Azsa (n = 410)			ShinNihon (n = 543)			Tohmatsu (n = 587)		
	Estimate	t-value	p-value*	Estimate	t-value	p-value*	Estimate	t-value	p-value*	Estimate	t-value	p-value*
Intercept	0.596	6.014	0.000	0.638	3.083	0.002	0.716	3.819	0.000	0.479	3.177	0.002
<i>lnASSETS</i>	0.207	23.909	0.000	0.216	12.979	0.000	0.200	12.667	0.000	0.207	16.075	0.000
<i>SUBS</i>	0.074	11.970	0.000	0.052	4.916	0.000	0.092	7.704	0.000	0.084	8.866	0.000
<i>CATA</i>	0.121	2.793	0.005	0.189	2.207	0.028	0.119	1.534	0.126	0.090	1.387	0.166
<i>Foreign</i>	0.042	0.961	0.337	0.092	0.972	0.332	0.013	0.162	0.872	0.017	0.279	0.781
<i>Quick</i>	-0.001	-0.119	0.905	-0.016	-1.138	0.256	0.015	1.023	0.307	0.001	0.114	0.909
<i>ROA</i>	0.071	0.524	0.601	-0.200	-0.806	0.420	0.231	0.891	0.373	0.214	1.072	0.284
<i>DE</i>	0.164	2.086	0.037	0.247	1.640	0.102	0.067	0.467	0.640	0.278	2.361	0.019
<i>Loss</i>	0.101	5.631	0.000	0.044	1.308	0.192	0.131	3.993	0.000	0.102	3.824	0.000
<i>SEC</i>	1.155	7.844	0.000	1.757	8.372	0.000	**	**	**	0.563	3.049	0.002
<i>Tokyo</i>	0.177	11.628	0.000	0.205	6.893	0.000	0.171	6.160	0.000	0.186	8.320	0.000
<i>YE</i>	-0.005	-0.306	0.760	-0.034	-1.041	0.298	0.027	0.859	0.391	-0.034	-1.498	0.135
<i>Share</i>	-0.520	-2.637	0.008	-1.009	-1.551	0.122	-1.265	-2.844	0.005	0.139	0.457	0.648
<i>DIFF</i>	0.125	4.052	0.000	0.087	0.751	0.453	0.067	0.685	0.494	0.067	1.932	0.054
<i>Power</i>	-0.079	-0.449	0.654	-0.162	-0.508	0.612	0.677	1.932	0.054	-0.098	-0.337	0.736
Adjusted R <sup>2</sup>	64.6%			71.0%			60.8%			66.0%		
F-ratio (p-value)	201.2 (.000)			72.6 (.000)			65.7 (.000)			82.4 (.000)		

\* All p-values are two-tailed.

\*\* No SEC registrant client is included in the sample and the variable *SEC* is excluded from the analysis.

Variable Definitions:

*lnASSETS* = natural log of total assets;

*SUBS* = square root of the number of consolidated subsidiaries;

*CATA* = current assets / total assets;

*Foreign* = foreign sales / total sales;

*Quick* = quick assets / current liabilities;

*ROA* = income before interest and tax / total assets;

*DE* = long-term debt / total assets;

*Loss* = indicator variable, 1 if loss reported in any of the past three years;

*SEC* = indicator variable, 1 if SEC registrant;

*Tokyo* = indicator variable, 1 if the company's headquarters is in Tokyo;

*YE* = indicator variable, 1 if non-March 31st year end;

*Share* = the number of clients to the number of companies in the industry for each Big 3;

*DIFF* = indicator variable, 1 if the auditor has the largest market share in the industry and if the auditor has a market share lead at least seven percentage points over its closest competitor;

*Power* = ratio of the natural log of company sales to the sum of logged sales of all companies in the industry audited by the company's auditor.

**Table 5**  
**Audit Team Size Regression Models**  
**(Dependent Variable is Natural Log of Number of Audit Team Staff)**

Panel A: Full Sample

Variables	Pooled Sample (n = 2,197)			Azsa (n = 619)			ShinNihon (n = 769)			Tohmatsu (n = 809)		
	Estimate	t-value	p-value*	Estimate	t-value	p-value*	Estimate	t-value	p-value*	Estimate	t-value	p-value*
Intercept	1.488	16.613	0.000	1.861	11.259	0.000	1.154	6.686	0.000	1.587	11.089	0.000
<i>lnASSETS</i>	0.099	13.512	0.000	0.080	6.472	0.000	0.126	8.979	0.000	0.078	7.029	0.000
<i>SUBS</i>	0.034	7.742	0.000	0.030	4.450	0.000	0.036	4.126	0.000	0.042	6.210	0.000
<i>CATA</i>	0.099	2.269	0.023	0.135	1.771	0.077	0.152	1.921	0.055	0.005	0.079	0.937
<i>Foreign</i>	-0.056	-1.418	0.156	0.003	0.049	0.961	-0.034	-0.465	0.642	-0.118	-2.004	0.045
<i>Quick</i>	-0.008	-1.050	0.294	-0.015	-1.229	0.220	0.003	0.195	0.846	0.004	0.426	0.670
<i>ROA</i>	0.021	0.152	0.879	0.055	0.235	0.814	-0.078	-0.294	0.769	-0.050	-0.248	0.804
<i>DE</i>	0.040	0.516	0.606	0.130	0.988	0.324	-0.154	-1.045	0.296	0.145	1.195	0.233
<i>Loss</i>	0.037	1.880	0.060	0.031	0.913	0.362	0.075	2.076	0.038	-0.001	-0.048	0.962
<i>SEC</i>	0.415	5.510	0.000	0.541	5.303	0.000	0.154	0.736	0.462	0.367	3.295	0.001
<i>Tokyo</i>	-0.030	-2.001	0.046	0.028	1.056	0.291	0.069	2.436	0.015	-0.189	-8.375	0.000
<i>YE</i>	0.029	1.741	0.082	-0.007	-0.240	0.810	0.103	3.092	0.002	0.010	0.408	0.684
<i>Share</i>	-0.412	-2.179	0.029	-1.678	-3.079	0.002	-0.407	-1.013	0.312	0.299	0.949	0.343
<i>DIFF</i>	0.005	0.154	0.878	0.098	0.916	0.360	0.000	-0.004	0.996	-0.001	-0.024	0.981
<i>Power</i>	-0.229	-1.696	0.090	0.137	0.723	0.470	-0.681	-2.337	0.020	0.015	0.060	0.952
Adjusted R <sup>2</sup>	34.6%			41.3%			34.0%			36.6%		
F-ratio (p-value)	84.0 (.000)			32.0 (.000)			29.3 (.000)			34.3 (.000)		

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Panel B: Excellent Company Sub-sample

Variables	Pooled Sample (n = 657)			Azsa (n = 209)			ShinNihon (n = 226)			Tohmatsu (n = 222)		
	Estimate	t-value	p-value*	Estimate	t-value	p-value*	Estimate	t-value	p-value*	Estimate	t-value	p-value*
Intercept	1.469	7.076	0.000	1.988	5.169	0.000	1.048	2.551	0.011	1.860	6.002	0.000
<i>lnASSETS</i>	0.088	5.421	0.000	0.065	2.295	0.023	0.129	3.978	0.000	0.043	1.831	0.069
<i>SUBS</i>	0.038	6.066	0.000	0.035	3.691	0.000	0.036	2.677	0.008	0.050	5.175	0.000
<i>CATA</i>	0.224	2.563	0.011	0.139	0.939	0.349	0.209	1.288	0.199	0.113	0.782	0.435
<i>Foreign</i>	-0.008	-0.123	0.902	0.072	0.655	0.513	-0.033	-0.284	0.777	-0.097	-0.884	0.378
<i>Quick</i>	-0.008	-0.618	0.537	-0.022	-0.855	0.393	0.008	0.345	0.731	0.000	0.011	0.991
<i>ROA</i>	-0.012	-0.039	0.969	0.149	0.273	0.785	-0.603	-1.062	0.289	0.501	1.144	0.254
<i>DE</i>	-0.218	-1.335	0.182	-0.123	-0.442	0.659	-0.878	-2.648	0.009	0.261	0.968	0.334
<i>Loss</i>	0.161	2.597	0.010	0.364	3.446	0.001	0.116	0.928	0.354	0.123	1.357	0.176
<i>SEC</i>	0.404	4.512	0.000	0.575	4.433	0.000	0.194	0.876	0.382	0.315	2.341	0.020
<i>Tokyo</i>	-0.069	-2.380	0.018	-0.074	-1.511	0.132	0.079	1.406	0.161	-0.259	-5.800	0.000
<i>YE</i>	0.059	1.650	0.099	0.060	0.992	0.322	0.194	2.727	0.007	-0.065	-1.182	0.238
<i>Share</i>	0.011	0.031	0.975	-1.287	-1.256	0.211	0.020	0.031	0.975	0.476	0.720	0.472
<i>DIFF</i>	-0.056	-0.864	0.388	-0.136	-0.585	0.560	-0.030	-0.207	0.836	0.008	0.106	0.916
<i>Power</i>	-0.006	-0.029	0.977	0.056	0.224	0.823	-0.090	-0.216	0.829	0.107	0.262	0.794
Adjusted R <sup>2</sup>		38.5%			44.4%			35.1%			45.8%	
F-ratio (p-value)		30.3 (.000)			12.9 (.000)			9.7 (.000)			14.3 (.000)	

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Panel C: Non-Excellent Company Sub-sample

Variables	Pooled Sample (n = 1540)			Azsa (n = 410)			ShinNihon (n = 543)			Tohmatsu (n = 587)		
	Estimate	t-value	p-value*	Estimate	t-value	p-value*	Estimate	t-value	p-value*	Estimate	t-value	p-value*
Intercept	1.568	13.661	0.000	1.874	8.728	0.000	1.336	6.027	0.000	1.598	8.856	0.000
<i>lnASSETS</i>	0.095	9.476	0.000	0.085	4.937	0.000	0.111	5.974	0.000	0.081	5.272	0.000
<i>SUBS</i>	0.034	4.703	0.000	0.025	2.233	0.026	0.047	3.308	0.001	0.035	3.104	0.002
<i>CATA</i>	0.074	1.479	0.139	0.147	1.659	0.098	0.157	1.707	0.088	-0.029	-0.381	0.704
<i>Foreign</i>	-0.132	-2.578	0.010	-0.073	-0.734	0.463	-0.078	-0.816	0.415	-0.152	-2.107	0.036
<i>Quick</i>	-0.012	-1.328	0.184	-0.015	-1.079	0.281	-0.006	-0.354	0.723	0.002	0.142	0.887
<i>ROA</i>	-0.089	-0.562	0.574	-0.107	-0.417	0.677	0.020	0.067	0.947	-0.386	-1.619	0.106
<i>DE</i>	0.172	1.894	0.058	0.311	1.993	0.047	0.086	0.509	0.611	0.174	1.232	0.218
<i>Loss</i>	0.023	1.113	0.266	-0.011	-0.303	0.762	0.084	2.159	0.031	-0.028	-0.874	0.382
<i>SEC</i>	0.356	2.084	0.037	0.417	1.915	0.056	**	**	**	0.417	1.888	0.060
<i>Tokyo</i>	-0.012	-0.689	0.491	0.081	2.643	0.009	0.067	2.032	0.043	-0.164	-6.161	0.000
<i>YE</i>	0.018	0.938	0.348	-0.044	-1.305	0.193	0.070	1.856	0.064	0.028	1.038	0.299
<i>Share</i>	-0.561	-2.454	0.014	-2.102	-3.112	0.002	-0.716	-1.360	0.174	0.279	0.768	0.443
<i>DIFF</i>	0.019	0.535	0.593	0.156	1.300	0.195	0.098	0.856	0.392	-0.010	-0.237	0.813
<i>Power</i>	-0.327	-1.609	0.108	0.372	1.124	0.262	-1.211	-2.920	0.004	0.003	0.009	0.993
Adjusted R <sup>2</sup>	20.2%			26.5%			21.7%			21.2%		
F-ratio (p-value)	28.9 (.000)			11.5 (.000)			12.6 (.000)			12.3 (.000)		

\* All p-values are two-tailed.

\*\* No SEC registrant client is included in the sample and the variable *SEC* is excluded from the analysis.

Variable Definitions:

*lnASSETS* = natural log of total assets;

*SUBS* = square root of the number of consolidated subsidiaries;

*CATA* = current assets / total assets;

*Foreign* = foreign sales / total sales;

*Quick* = quick assets / current liabilities;

*ROA* = income before interest and tax / total assets;

*DE* = long-term debt / total assets;

*Loss* = indicator variable, 1 if loss reported in any of the past three years;

*SEC* = indicator variable, 1 if SEC registrant;

*Tokyo* = indicator variable, 1 if the company's headquarters is in Tokyo;

*YE* = indicator variable, 1 if non-March 31st year end;

*Share* = the number of clients to the number of companies in the industry for each Big 3;

*DIFF* = indicator variable, 1 if the auditor has the largest market share in the industry and if the auditor has a market share lead at least seven percentage points over its closest competitor;

*Power* = ratio of the natural log of company sales to the sum of logged sales of all companies in the industry audited by the company's auditor.