Audit Fee Premiums of Big Eight Firms: Evidence from the Market for Medium-Size U.K. Auditees

Ayoib Che-Ahmad
Keith A. Houghton

The modeling of fees within certain audit markets (notably, the United States and Australia) has assisted in understanding the factors that can explain the variability of audit fees. One important influence on fees is said to be the premiums charged by so-called "higher quality" or "first tier" (Big Eight or, more recently, Big Six) auditors. The present study examines this issue in one important, but much under-researched, market, that of the United Kingdom. Specifically, this study examines fee premiums paid (if any) by auditees which are not among the U.K.'s biggest companies but are firms that may be labeled as "medium-size." Using a matched-pair sampling technique to overcome a potentially serious methodological problem relating to the underrepresentation of non-Big Eight audited companies, this study found no price premium for Big Eight auditors compared to other suppliers in this sector. This suggests an absence of fee premiums for such auditors. Consistent with much previous research, other influences on audit fees (including auditees' size, complexity, and risk) were all found to be significant, with auditor location being a less significant factor.

INTRODUCTION

An understanding of the pricing of audit services is of interest and importance to suppliers and users of those services as well as to market regulators. There is evidence that some regulators view the audit services market as a homogeneous commodity and the presence of systematic price differences is interpreted

Ayoib Che-Ahmad • School of Accounting, Universiti Utara Malaysia, 06010 Sintok, Kedah, Malaysia. **K.A. Houghton** • Department of Accounting and Finance, University of Melbourne, Parkville, Victoria 3052, Australia. *E-mail:* k.houghton@ecoa cfin.unimelb.edu.au

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by some as the existence of an uncompetitive market. A United States Senate Sub-Committee concluded that there was enough evidence to allege a serious lack of competition in the audit service market based on data on concentration statistics (U.S. Senate 1977). However, a market structure which has a limited (or concentrated) set of suppliers does not necessarily imply the existence of monopolistic pricing (Francis 1984). In addition, numerous studies (mostly in the United States and Australia) have shown that the audit services market (even where dominated by the Big Eight or Big Six sets of firms) is efficient and competitive (see, e.g., Simunic 1980; Francis 1984). Perhaps the most recent evidence in respect of the presence of the level of competition for audit services comes from Australia, where the Trade Practices Commission (1992, 89) concluded that "there is active competition between audit firms despite the fact that there has been concentration in recent years in the number of accounting firms."

Systematic differences in audit prices charged by "Big" auditors (Big Six or Big Eight audit firms)[1] may, in fact, be evidence of higher quality rather than of a price monopoly by those firms. The empirical tests of this product differentiation (higher quality) hypothesis have been "suggestive but inconclusive" (Simunic and Stein 1987), although the recent study of Craswell, Francis, and Taylor (1993) based on auditor concentration (and not on the Big Eight/non-Big Eight dichotomy) found fee premiums for auditors in industry specializations. The mixed nature of the results of previous research provides one motivation for the current research. A further motivation for the present study relates to the fact that there is little evidence on this question in respect of one large and important audit market, that of the United Kingdom. As indicated below, the vast majority of the empirical findings relate to the audit markets in the United States and Australia. In addition, a further motivation relates to a methodological issue raised from previous research. It can be argued that the dominance of the "Big" firm auditees in the samples used in previous research has potential for masking the presence of an audit fee price premium, as measured by a dummy variable, within linear regression models. The substance of the methodological issue is discussed below.

The next section of the article provides a theoretical rationale of audit firm quality (and price) differentiation. This is followed by a review of the relevant literature in audit fee modeling. The sections that follow discuss: (1) the focus of the present study, (2) the variables used in this study, and (3) the research design and sample selection. The final two sections present the empirical findings and analysis of the results and provide a summary and conclusion of the study.

UNDERPINNING THEORIES OF AUDIT FIRM QUALITY

Several alternative theories have been proposed to explain the existence of product differentiation (i.e., audit quality differential commanding an audit fee

premium) in the audit services market. According to DeAngelo (1981), auditor size alone can explain the supply of a higher level of audit quality (defined as the joint probability of detecting and reporting material financial errors).

Central to her argument is the notion of "client-specific quasi-economic rents" which exist because of auditor startup and client switching costs that serve as a "collateral" or a "bond" on independence and audit quality. Large audit firms stand to lose more client-specific quasi-economic rents simply because they have more clients. To avoid this loss, large firms have to produce higher quality audits to maintain their reputation.

While the preceding argument views audit quality as a passive by-product of client-specific quasi-rents, there is an alternative view which suggests that audit firms are explicitly motivated to develop and maintain brand name reputations for quality in order to secure and protect quasi-rents arising from the investment in brand names (reputations) (Francis and Wilson 1988). This argument is based on the brand name investment model of Klein, Crawford, and Alchian (1978) and Klein and Leffler (1981). According to this theory, the brand name development comes first and this, in turn, leads to a quality-assuring price that is higher than the minimum quality price. Here, the brand name is the "collateral" to provide incentive for producing quality audit and the loss of brand name means the loss of the present value of future quasi-rents (Francis and Wilson 1988).

Simunic and Stein (1987) argued that the audit services market should be viewed from a demand-based model of product differentiation. According to them, audit service possesses two characteristics that are valued by companies' top management. The first characteristic is the contribution of audit services to the organization control and the second is the credibility of audit services with external financial statement users. The former refers to the demand which arises from the internal agency conflicts of an organization, while the latter refers to the demand which arises from the external agency relationship. The second characteristic is simply associated with an auditor's reputation as a quality audit supplier (i.e., brand name) (Simunic and Stein 1987). The demand for credible audit services is assumed to arise in the event of moral hazard as a result of the relationship with the external agency.

The demand-based and brand name investment models are similar in the sense that both models use the brand name auditors as quality audit suppliers. Simunic and Stein (1987) argue that the demand-based model has an important advantage over the client-specific model of DeAngelo (1981). The demand-based model is more flexible and it allows alternative ranking to firms (i.e., it is not merely tied with auditor's size) in different circumstances. Furthermore, Simunic and Stein (1987) argued that DeAngelo's assumptions lack empirical evidence. For example, there is a lack of evidence of a significant learning curve over time in auditing. In addition, evidence from psychology research suggests that sunk costs do affect subsequent decision making (Arkes and Blumer 1985). Francis and

Wilson (1988) developed models to test both contending theories of audit firm quality differences. Their results support the brand name model in which the Big Eight audit firms are defined as higher quality suppliers.

It follows from the above that there should be a systematic relationship between audit quality and audit prices. All other things being equal, audit fees charged by the "first tier"—Big Eight or Big Six—auditors (i.e., the quality differentiated suppliers) should be significantly higher than those charged by other audit suppliers to reflect the better quality services provided by them. However, it should be noted that quality product differentiation may be confounded by the presence of economies of scale for Big Eight auditors, which can exist in either a monopolistic or a competitive market structure (Simunic 1980). Similarly, it can be argued that product differentiation may also be confounded by the presence of non-Big Eight diseconomies of scale in the audit of large clients. Additionally, it can be argued that for different sectors of the market—in particular, the medium and smaller auditee section—differing forces and levels of competition exist which also influence the existence and extent of "quality" premiums.

Empirical Audit Fee Literature

In the United Kingdom, there are five major studies of audit fee determination: Taylor and Baker (1981); Taffler and Ramalinggam (1982); Ramzy (1988); Chan, Ezzamel, and Gwilliam (1993); and Pong and Whittington (1994). There is a relatively extensive literature on the determinants of audit fees in the United States and Australia, including Gilling and Stanton (1978); Elliot and Korpi (1978); Simunic (1980); Pound and Francis (1981); Francis (1984); Simon (1985); Francis and Stokes (1986); Palmrose (1986); Francis and Simon (1987); Simon and Francis (1988); Jubb, Houghton, and Butterworth (forthcoming); Craswell, Francis, and Taylor (1993); and Butterworth and Houghton (1995), among others. Other research has looked at the market for audit services in other countries, including Low, Tan, and Kah (1990) and Lam and Chang (1993) in Singapore; Firth (1985) in New Zealand; and Simon, Ramanan, and Dugar (1986) in India. Most of these studies utilized multiple regression techniques to identify audit fee determinants and have examined auditees that are large listed companies.

Summary of Findings of Audit Fee Modeling Research

Generally, auditee size was found to be the most significant variable in explaining audit fees in most preceding studies including: Simunic (1980); Taylor and Baker (1981), Francis (1984); Simon (1985); Simon and Francis (1988); Jubb et al. (forthcoming), and Butterworth and Houghton (1995). The majority of these

studies used total assets as a proxy for auditee size. Taffler and Ramalinggam (1982) used sales, while Elliot and Korpi (1978), Firth (1985), and Chan et al. (1993) used both sales and total assets.

Measures of the auditees' organizational complexity were found to be significant in explaining audit fees in most studies. For example, Taylor and Baker (1981), Francis (1984), Francis and Stokes (1986), Palmrose (1986), Francis and Simon (1987), Simon and Francis (1988), Butterworth and Houghton (1995), and Jubb et al. (forthcoming) found the number of subsidiaries to be highly significant. A similar (but arguably weaker) measure, the ratio of auditee's receivables and/or inventories to the auditee's total assets, was also found to be significant in several studies, including Simunic (1980), Simon (1985), Firth (1985), Francis and Stokes (1986), and Simon and Francis (1988). In addition, Simunic (1980) and Chan et al. (1993) reported that audit fee diversification significantly explained audit fees.

Evidence regarding the significance of auditee risk is less conclusive. Francis (1984) did not find certain measures of risk (i.e., equity/debt ratio, operating losses and audit opinion) to be significant. However, equity/debt ratio and audit opinion were later found to be significant in Francis and Stokes (1986). Audit opinion was also significant in several other studies, including Simunic (1980), Palmrose (1986), Francis and Simon (1987), Simon and Francis (1988), and Butterworth and Houghton (1995), among others. Another measure of risk—unsystematic risk—was significant in Firth (1985).

Other Variables Influencing Audit Fees

Other explanatory variables which have been shown to affect the level of audit fees are "busy season" and audit location. It could be expected that during an auditor's "busy season," the work loads for audit firms increase and, as a function of either demand or cost factors, higher prices might be charged for "busy season" clients. Rubin (1988) found this variable to be significant in a sample of the public sector market but Francis (1984) and Chan et al. (1993) found it not to be so in the private sector. Similarly, the audit location (particularly in some markets) might influence the level of variation in audit fee. Palmrose (1986) measured the number of different auditee's locations requiring on-site visits by the auditors[2] while Chan et al. (1993) used a dichotomous variable representing audit location (showing an audit fee premium for London office audits as opposed to those based in non-London locations). Both studies observed a significant association between audit location and audit fees.

Clearly, many other factors may influence the fee paid, not least of which is the state of the economy and the capacity of an auditee to purchase premium qual-

ity audit services. These variables and many others have not been examined in the existing literature.

Audit Fees: Empirical Results as to the Existence of Fee Premiums

Simunic's (1980) results did not support the existence of premium pricing for Big Eight auditors but suggested that the Big Eight, as a group, tended to charge lower fees than the non-Big Eight firms. This is consistent with the presence of cost savings in the form of economies of scale in large audit firms. However, one audit firm, Price Waterhouse, received fees that were higher than expected, controlling for the size and complexity of auditees. Simunic attributed this to product differentiation (i.e., higher quality audit services) for that firm. Other studies replicated and tested Simunic's model with mixed results. Simon (1985), Firth (1985), Chung and Lindsay (1988), and Chan et al. (1993) found auditor size not to be significant. Others, such as Francis (1984), Palmrose (1986), Simon and Francis (1988), Francis and Stokes (1986), Simon et al. (1986), Ettredge and Greenberg (1990), and Butterworth and Houghton (1995) found a significant association between auditor size and audit fees based on a Big Eight/non-Big Eight dichotomy. Palmrose (1986), Francis and Stokes (1986), and Francis and Simon (1987) reported that Big Eight prices were higher than non-Big Eight prices for small auditees, although no price differences were observed for large auditees, suggesting that there is product differentiation in smaller auditees' market and diseconomies of scale when non-Big Eight firms audit large auditees. Francis (1984) and Chan et al. 1993), on the other hand, observed that Big Eight firms have significantly higher audit prices than non-Big Eight in samples of both large and small auditees. It should be noted that the companies in Francis' (1984) sample were significantly smaller than those in other samples (e.g., Simunic 1980; Palmrose 1986). Hence, it has been argued that it is difficult to generalize the existence of Big Eight (or Big Six) audit premiums (Simunic and Stein 1987) because research has been on differing sectors of the market.

Thus, while the underpinning theory discussed above suggests the existence of quality fee premiums for the Big Eight auditors, the empirical evidence on this issue is, at best, mixed or, at worse, confused. The following discussion offers one possible explanation for these conflicting results.

Methodological Flaw: Need for Matched-Pair Sample

Simunic and Stein (1987) attributed this conflicting evidence to the methodological problems that are present in most studies. In particular, they noted (p. 4):

> Many audit fee determinants are correlated with company size, the relation between fees and size is non-linear, and, because of the dominance of the Big Eight firms in the audit of large

companies, it is difficult to obtain a sample of audits in which the clients of Big Eight firms are well matched in size. A failure to properly control for non-linear client size effects on fees can easily lead to biased coefficient for the auditor identity variable.

Dopuch (1984) observed the same methodological problem when discussing Palmrose's (1984) paper on auditor choice that utilized logit regression. He suggested further studies adopt a matched-pair sampling technique to solve the problem. Simunic and Stein (1987) made a similar suggestion.

Pong and Whittington (1994) also argue that the conventional approach to audit fee modeling is methodologically flawed, although they do not specifically recommend the use of matched pair sampling to overcome the problems. As Table 1 shows, most of the studies use unbalanced samples (Big Eight versus non-Big Eight auditees) and no study listed uses a matched-pair sampling method. For example, the Big Eight auditees for the sample size in Simunic (1980) are four times as large as non-Big Eight auditees in the large auditee sample and one-and-a-half times as large those in the small auditee sample. Given the concerns of Simunic and Stein (1987), the structure of these samples may, potentially, have given rise to unreliable and unstable results. As noted below, the present study examines audit fee premiums paid by auditees that might be referred to as "medium size." This is useful for two reasons. First, it allows for more appropriate matching on Big Eight and non-Big Eight auditees to occur. Second, it provides the opportunity to examine a section of the market for audit services which is much underresearched as compared with the market for large auditees.

FOCUS OF PRESENT STUDY

The foregoing provides a theoretical rationale for the presence of audit quality and describes the existing empirical evidence. Consistent with the theory, it is hypothesized that Big Eight auditors will be the suppliers of higher quality audits as compared with the non-Big Eight firms, and will receive fee premiums in return for the additional quality. Specifically, the proposition is tested with the following (null form) hypothesis:

H_0: In a given year, the audit fees paid by medium-size U.K. auditees to Big Eight audit firms are not significantly higher than to non-Big Eight firms, all other things being equal.

If this hypothesis is rejected, there is evidence consistent with a price or fee premium in the audit services market for Big Eight auditors. Given the theory noted above, this would support the perception that the Big Eight audit firms are quality-differentiated auditors for this important section of the market, the so-called "medium-size" auditees. If the hypothesis is not rejected, there is evidence that a fee

TABLE 1
Summary of Sample Size and Means of Total Assets in Research on Audit Quality Premium Based on Big Eight/Non-Big Eight Dichotomy

Research Paper	*Number of Auditees in Samples*						*Mean Assets (in millions) (Standard Deviation in Parentheses)*						
	Small		*Large*		*Total*		*Small*		*Large*		*Total*		*Total*
	B8	*NB8*	*B8*	*NB8*	*B8*	*NB8*	*B8*	*NB8*	*B8*	*NB8*	*B8*	*NB8*	*Total*
Simunic (1980)	100[a] (59%)	71[a] (41%)	164[a] (81%)	38[a] (19%)	264[a] (71%)	109[a] (29%)	NA	NA	NA	NA	695.6[bc] (1311.8)	178.9[bc] (672.8)	555.1[bc] (1194.5)
Palmrose (1986)	NA	NA	NA	NA	298 (83%)	63 (17%)	NA	NA	NA	NA	1510[c] (7497)	79[c] (203)	1260[c] (6822)
Francis (1984)	31 (46%)	37 (54%)	33 (49%)	35 (51%)	64 (47%)	72 (53%)	NA	NA	NA	NA	NA	NA	49[d] (NA)
Simon (1985)	NA	NA	NA	NA	137 (79%)	36 (21%)	NA	NA	NA	NA	NA	NA	2701[c] (NA)
Francis & Stokes (1986)	39 (41%)	57 (59%)	71 (74%)	25 (26%)	110 (57%)	82 (43%)	2.044[d] (.880)	1.778[d] (.907)	597.917[d] (507.405)	616.598[d] (417.080)	386.653[d] (NA)	189.223[d] (NA)	NA
Francis & Simon (1987)	129 (62%)	79 (38%)	NA	NA	129 (62%)	79 (38%)	33.7[c] (36.9)	25.9[c] (32.5)	NA	NA	33.7[c] (36.9)	25.9[c] (32.5)	30[c] (35.1)

Notes:
[a] Data excludes bank respondents.
[b] Data includes bank respondents (i.e., 289 auditees using Big Eight Auditors and 108 using Non-Big Eight Auditors).
[c] Figures in U.S. dollars.
[d] Figures in Australian dollars.
B8 = Big Eight Auditees.
NB8 = Non-Big Eight Auditees.

premium does not exist and that in the section of the market under investigation there is no discernible "quality" differentiation between Big Eight and Non Big Eight auditors. Importantly, this study will not just contribute to our understanding of the market for "medium size" auditees; it will also add to a remarkably small number of studies that have examined one of the largest and arguably most important markets for audit services in the world, that of the United Kingdom.

In order to test for price premium, other factors which might affect audit fees will be controlled. The next section identifies these control variables as well as the dependent variable in the study and the measures used for each variable.

DESCRIPTION OF INDEPENDENT AND DEPENDENT VARIABLES

Auditee Size

It is expected that as client size increases, so too will the audit fee, although not in a linear fashion. There are at least four aspects to this relationship. First, as the size of the auditee increases, all other things being equal, the audit work which has to be carried out will also increase. Second, as with other commodities, it is easier for the auditor to achieve economies of scale in its production function as output increases. Third, economies of scale will also occur from the use of audit sampling techniques, because as the auditee size becomes larger, the audit sample for compliance and substantive testings will increase at a decreasing rate (Butterworth and Houghton 1995). Finally, it can be argued that larger companies are likely to have more sophisticated internal control systems. Therefore the larger the auditee, the more likely economics can be achieved in the audit process. In the present study, total assets are used to measure auditee size.

Auditee Complexity

As with auditee size, auditee complexity is also hypothesized to be positively related to the audit fees. A complex firm which has a complex legal and/or organizational structure requires additional audit time and hence greater audit fees. From the contracting theory point of view, as a firm's complexity increases, so does the possibility of moral hazard. All other things being equal, there is a greater chance for unscrupulous managers to transfer wealth without being detected, hence the need for audit quantity and quality.

In this study, the number of consolidated subsidiaries plus one (i.e., subsidiary company plus its holding company) is used as a measure of auditee complexity. This continuous measure of complexity represents the auditee's legal/organizational dispersion. As with size, this relationship is not linear and as complexity increases audit fees, most likely, will rise at a decreasing rate.

Auditee Risk

Risk is an important factor in audit fee explanation for two reasons. It is expected that as the auditee risk increases, the audit fee will also rise as a result of either more audit work or "insurance" premium considerations. There are several possible measures of risk (see Jubb et al. forthcoming). One overall measure of auditee risk comes from the capital market—systematic risk or beta. The present study uses systematic risk (ß), which represents the volatility of stocks' return to the market. Chan et al. (1993, 769) argue that such a market-based measure of risk is a good proxy for client or auditee risk.

Other Independent Variables

As noted from the analysis of the previous literature, two further variables that might be expected to affect audit fees are included in the model. The first is the timing of audit work and the other is the auditor location. It is hypothesized that audits performed during the "busy season" (in the United Kingdom, this is defined as being between December 1 and March 31) are more costly because of greater demand for auditors during that time (Rubin 1988; Chan et al. 1993). A dummy variable is used to classify the season based on accounting year end which is disclosed in the annual reports. Similarly, audit location is thought to influence audit costs due to different efforts that are necessary for coordination of the engagement (Palmrose 1986). Moreover, audit staff costs in certain "premium" locations are thought to be higher than those in lower cost (provincial) cities. As with Chan et al. (1993), a dummy variable is used to represent different auditor locations. It is hypothesized that South-Eastern based (i.e., London-based) U.K. auditors charge higher fees than in other U.K. locations.

Dependent Variable

The dependent variable for the model is the monetary value of audit fees in 1989. In the United Kingdom, unlike the United States, data on audit fees are publicly available because of a legal requirement which includes substantial penalties for nondisclosure as well as for inaccurate disclosure.

Research Design

In the context of the U.K. market, the present study extends the earlier studies of audit fee determinants using a sample of matched-pair companies, in terms of auditee size and industry classification, that are audited by Big Eight and the non-Big Eight frims.

The basis for the sample in this study is the list of 500 U.K. companies ranked from 501 to 1000 in the Times 1000 (1990) edition. The selection of the group of companies, which were not among the United Kingdom's largest, has three important advantages. First, it lowers the possibility of the presence of diseconomies of scale for non-Big Eight auditors for large audits. Second, it increases the number of instances of non-Big Eight auditees from within the sample. Third, it provides evidence from a sector of the market not as widely or extensively researched. Each of these companies was examined to determine its auditors based on the information in the *International Stock Exchange Yearbook* (1990). Those companies that were either not listed in the *Stock Exchange Yearbook* or did not have information regarding their auditors, were eliminated from the sample. Companies that were audited by more than one audit firm were also excluded as it was not possible to divide the level of fees paid to each of the listed auditors. As a result, 215 companies remained, with 55 companies (i.e., 25%) audited by the non-Big Eight firms and the remainder relating to the Big Eight auditors. Each non-Big Eight auditee was matched with a Big Eight auditee in the same industry with a similar size company as measured by sales(± U.K.£20 million), in the same industry (as defined by the London Stock Exchange classification), and having a Big Eight auditor. In all, 52 matched-pair companies were included in the data set at this point, three having been excluded due to the lack of a suitable matched pair.

Information on systematic risk was obtained from the London Business School Risk Measurement Service (1990). Several more companies that did not have the necessary data were deleted from the dataset, leaving 42 pairs of companies. One pair of companies was deleted for statistical reasons due to their undue (and therefore unrepresentative) influence on the regression equation. Table 2 summarizes the construction of the data set.

A regression of the log of audit fees on the explanatory variables is utilized to provide the evidence on price premium. Specifically, the model is defined as the equation below:

$$AFee_i = b_0 + b_1 Aud_i + b_2 Size_i + b_3 Complex_i + b_4 Risk_i + b_5 Season_i + b_6 Location_i + \mu$$

where:
- $AFee_i$ = Audit fee charged to auditee i ($\log_{10}$ transformed)
- Aud_i = size of auditee i's auditor (Big Eight or Non Big Eight)
- $Size_i$ = size of auditee i (total assets, $\log_{10}$ transformed)
- $Complex_i$ = complexity of auditee i (number of subsidiaries + 1)
- $Risk_i$ = risk of auditee i (beta)
- $Season_i$ = busy period for auditors or not (coded 0/1)
- $Location_i$ = location of auditor (South East, U.K.) or not (coded 0/1)
- μ = error term (assumed to be normally distributed)

TABLE 2
Sample Selection Procedure

Total companies ranked from 501 to 1000 in The Times 1000 (1990 edition)	500
Less companies not listed or without information about auditors in the International Stock Exchange Yearbook (1990) edition	285
A. Total Preliminary Sample	215
Companies audited by Non-Big Eight firms from preliminary sample	55
Less Non-Big Eight auditees which did not have suitable pairs	3
	52
Less companies eliminated due to missing data	9
Sample of Non-Big Eight auditees	43
Add matched pairs from Big Eight auditees	3
B. Final Sample Used for Preliminary Analysis	86
Less company pair deleted due to undue influence on regression estimate	2
C. Final Sample Upon Which Analysis is Based	84
Number of pairs	42

RESULTS OF THE ANALYSIS

Preliminary Analysis

Table 3 presents the descriptive statistics for all variables used in the model. The audit fees for the sample population range from (U.K.) £28,000 to £501,000, while sales range from £60 million to £314 million. Inspection of these variables reveals that some of them—in particular, those that proxy for auditee size and complexity—were not normally distributed and, thus, required transformation for the evidence that followed.[3]

Table 4 presents a matrix of simple correlation coefficients for the transformed variables in the model. The first row contains the correlation of the dependent variable (i.e., audit fees) with each of the independent variables. Several variables that proxy for size, complexity, and audit location are significantly correlated with audit fees. There are two significant correlations among independent variables as expected. Total assets £($\log_{10}$ transformed) was found to be significantly correlated with number of consolidated subsidiaries (also $\log_{10}$ trans-

TABLE 3
Descriptive Statistics of Dependent and Control Variables

	Mean	*Standard Deviation*	*Kurtosis*	*Skewness*	*Minimum*	*Maximum*
Audit Fees (U.K.£)	153452.38	98928.89	2.21	1.40	34000	501000
Size						
Total Assets (£000)	115403	102178	12.51	3.08	29,684	681,000
Turnover (£000)	119532	36226	8.83	2.12	59336	314,000
Complexity						
Number of Subsidiaries[1]	18.37	15.27	18.83	3.25	1	106
Risk						
Beta[2]	0.93	0.23	0.18	–0.47	0.25	1.43
Busy Season[3]	0.63	0.49	–1.74	–0.55	0	1
Location[4]	0.60	0.49	–1.89	–0.40	0	1

Notes: [1]Number of consolidated subsidiaries plus one (holding company).
[2]Beta is systematic or market risk—subsequently designated as "risk."
[3]Categorical measure for "busy season," coded 1 if accounting year-end lies within December—March; 0 otherwise.
[4]Dichotomous variable for auditor's location, coded 1 if an audit carried out by a London office; 1 otherwise.

formed) at $r = 0.2321$. Unexpectedly, the correlation between sales ($\log_{10}$ transformed) and total assets is not significant ($r = 0.1968$), which is contrary to expectations (one would expect two measures of size to be highly correlated) and previous findings (see Firth 1985; Chan et al. 1993).

One plausible explanation for this result is different intensity in labor and capital utilization. For example, companies in the engineering industry are more capital intensive than companies in the leisure industry. Furthermore, it could be due to the economic recession in the period of study which caused variable earnings in some companies. In general, these correlations are not expected to create a significant problem in interpreting the regression results. The impact of these correlations on the regressions results will be further noted in the analysis that follows. Note that no significant correlations were detected between the hypothesis variable (Big Eight/non-Big Eight) and the control variables.

Univariate Analysis

A comparison of group means (Big Eight/non-Big Eight) for each dependent and independent variable is provided in Table 5. The mean sales is about U.K.£199 million, which is substantially smaller than another U.K.-based study (Chan et al. 1993). A univariate test (*t*-test) indicates no significant difference between the independent variables (size, complexity, etc.) for the two subsamples (Big Eight auditees/non-Big Eight auditees). In other words, the results on the

TABLE 4
Pearson Product-Moment Correlation Coefficients
(n = 84)

	Big Eight/ Non-Big Eight[1]	*Total Assets*[2]	*Turnover*[3]	*Complexity*[4]	*Risk*[5]	*Busy Season*[6]	*Location*[7]
Audit Fee[8]	0.1422	0.4408**	0.1485	.6344**	0.2437*	0.0060	0.2111
Big Eight/Non-Big Eight		0.1808	0.0490	0.1336	0.0197	0.0247	–.0485
Total Assets			0.1968	0.2321*	–.0113	–.1369	0.1622
Turnover				0.0196	0.0130	0.0269	0.0840
Complexity					0.1229	0.0680	–.0221
Busy Season						–.1198	0.1615

Notes: *Significant level at .05; **significant level at .01 (two-tailed).
[1]Big Eight/Non-Big Eight coded Big Eight = 1, Non-Big Eight = 0.
[2]Size: Total assets with Log10 transformation.
[3]Size: Turnover with Log_{10} transformation.
[4]Complexity: Measured as number of consolidated subsidiaries plus one (for holding company).
[5]Risk: Systematic risk, measured as beta.
[6]Busy Season: coded 1 if within auditors busy season, otherwise 0.
[7]Location: coded 1 if in "premium" or high cost location, otherwise 0.
[8]Fee paid to company auditor with Log_{10} transformation.

TABLE 5
Means and Standard Deviations (in parentheses) of the Dependent and Independent Variables Used in the Regression Tests

Variables	*Big Eight Auditees*	*Non-Big Eight Auditees*	*T-test*
Audit Fee*	5.1423 (0.261)	5.0664 (0.273)	−1.30
Size*	8.0084 (0.276)	7.9067 (0.284)	−1.66
Complexity*	4.0816 (1.556)	3.6736 (1.508)	−1.22
Risk	0.9343 (0.233)	0.9252 (0.233)	−0.18
Busy Season`	0.6429 (0.485)	0.6190 (0.492)	−0.22
Location	0.5714 (0.501)	0.6190 (0.492)	0.44

Note: *Log_{10} transformed.

auditor identity variable are not likely to be confounded by systematic differences in the other variables in the model.

Multivariate Analysis

In order to test for audit fee determinants, several regressions were estimated where audit fees were regressed on a set of independent variables.[4] Table 6 reveals the final result.[5] The signs of all regression coefficients are as expected. A good linear fit was achieved with adjusted R^2 of 0.5135.[6] Regression assumptions of normally distributed residuals and constant variance were not violated.

However, the auditor identity variable (Big Eight/non-Big Eight) was not significant, as hypothesized. This result is consistent with that of Simunic (1980). It does not support the existence of premium pricing for the Big Eight auditors and is consistent with the presence of competition in this segment of the market (i.e., the "medium-size" sector of the U.K. market).[7] Using Simunic's framework, it

TABLE 6
Results of Ordinary Least Square Regression of Big Eight/Non-Big Eight, Size, Complexity, Risk, Busy Season, and Location on Audit Fees
(n = 84)

Independent Variables	*Expected Sign*	*Coefficient*	*Standard Error*	*T-test*	*Significant Level*
Big Eight/ Non-Big Eight	+	0.0105	0.0419	0.251	0.8028
Size	+	0.2771	0.0783	3.536	0.0070
Complexity	+	0.0955	0.0141	6.787	0.0000
Risk	+	0.1844	0.0920	2.003	0.0487
Busy Season	+	0.0133	0.0436	0.306	0.7607
Location	+	0.0787	0.0432	1.822	0.0724
Constant	+	2.2980	0.6234	3.686	0.0004

Model statistics: Adjusted R^2 = 51.35%; *F*-ratio = 15.60003; Significant *F* = 0.000.

may also imply that there are no diseconomies of scale when non-Big Eight firms audit medium-size auditees and that audit services may be viewed as homogeneous goods, at least in this segment of the U.K. market.

Consistent with a priori reasoning, all measures of size, complexity, and risks were found to be significant. In particular, the proxy risk (beta), which had not been found statistically significant in previous studies of audit fees, was significantly associated with audit fees. This confirms the theory presented by Jubb et al. (forthcoming) that auditee risk is reflected in the fee charged by the auditor. The result for variable "busy season" is insignificant. This is consistent with the growing phenomenon of year-round audits and partial audits being undertaken in non-busy seasons. Such work patterns reduce or eliminate the premium of work signed off during the "busy" season.

The audit location variable was (weakly) significant. This result is consistent with the presence of higher costs for auditors within the London area (as opposed to other parts of the United Kingdom), or reflects that London auditors provide a higher quality audit than auditors in other locations, which confirms the earlier result that audit location is an explanatory variable within the U.K. market.

CONCLUSION

This study has examined the presence or absence of price premiums for Big Eight auditors in the U.K. market for audit services. The study was motivated from two perspectives: (1) the limited evidence concerning the U.K. market for audit services; and (2) the largely inconclusive evidence concerning audit quality premiums.

In respect of the second motivation, it is observed that many previous studies have been based on auditee samples where there is significant underrepresentation of non-Big Eight (or non-Big Six) auditees. It is argued that this potentially important methodological flaw may give rise to unreliable results. Using a matched-pair sample of Big Eight and non-Big Eight auditees within the medium-size sector of the U.K. market for auditee services, the present study tested for the presence of the audit premium paid to Big Eight auditors.

In addition to examining whether the auditor class variable explains audit fees, the present study controlled for the variability of audit fees explainable by auditee size (total assets), complexity, and risk and whether the audit is undertaken within the busy season and within certain geographic sectors of the market. These control variables were all hypothesized to be positive. The empirical results show that as auditee size, complexity, and risk increased, so did the auditee's audit fee. Further, audits undertaken within the South East (i.e., London) region of the United Kingdom were (weakly) significantly higher than audits undertaken elsewhere in the United Kingdom. No fee premium appeared to be paid for audits completed in the so-called busy season.

The hypothesized variable, Big Eight/non-Big Eight auditor, was not significant and it can be concluded that no price premium is paid within this sector of the market for Big Eight auditors. This conclusion is, however, limited to a sector of the market that does not include the largest of listed U.K. companies.

The conclusions reached in the present study are limited in several ways. First, a matched-pair sampling technique was used and the validity of the conclusions relies, in part, on the quality of the matching process. As indicated above, great care was taken in this process so as to minimize any threat to validity. Second, since the study relates to "medium-size" auditees, the validity of the conclusions may not hold for other sections of the audit market, in particular for the large auditee section of the market where non-Big Eight auditors may not compete. Third, the model specified is not complete. The adjusted R^2 showed that only about half the variability in audit fees was explained by the model. Other factors or variables, omitted in this study, may explain other aspects of the variability in audit fees. If these variables interact with the Big Eight/non-Big Eight effect, the conclusions drawn from the results in this study may need to be reconsidered.

Finally, the effect of the hypothesis variable may not be the same in some other audit markets. In the United Kingdom, the distinction between the Big Eight, (now Big Six) and other auditors is comparatively clearcut, as it is in several other countries such as the United States and Australia. This distinction is less clear in many European nations as well as in some countries in Asia, where large local or national (as opposed to international) firms are major suppliers of audit services.

These limitations provide several opportunities for further research. In particular, research comparing the differing effects that variables such as auditor class, auditee complexity, or risk may have on fees between different national audit markets, may provide valuable insights into the market for audit services in both developed and developing economies.

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NOTES

1. In the late 1980s, certain mergers occurred, reducing the then-Big Eight and audit firms to the Big Six. Many of the research studies noted here took place prior to this change. "Big Eight"

and "Big Six" are used as synonyms to describe the first tier of auditors, all of which are international in operation, although the names sometimes vary from one nation to another. The Big Eight firms within the United Kingdom are: Price Waterhouse, Arthur Andersen, Arthur Young, Peat Marwick McLintock, Deloitte Haskins and Sells, Ernst and Whinney, Touche Ross, and Coopers and Lybrand. Arthur Young and Ernst and Whinney merged to become Ernst and Young, while Coopers and Lybrand merged with Deloitte and Sells to become Coopers Lybrand and Deloitte. These mergers occurred in the United Kingdom in 1989 and 1990, respectively.

2. One might argue, however, that the number of different on-site locations required in the audit is a proxy for auditee complexity.
3. The measures for some variables, plus the dependent variable, were adjusted using a logarithmic transformation.
4. Both measures of size (i.e., LGTOVER and LGTA) were tested independent of each other. LGTOVER was dropped from the model due to its lack of significance. As expected, it was not significant due to the matching procedure using a sample selection. The result for the hypothesis variable is identical, as are the results for other explanatory variables.
5. A separate regression was also carried out with the outliers (one pair of companies). The results for all variables are similar except for systematic risk (BETA) and audit location (LOCAT) variables. BETA is not significant at all, while LOCAT is more significant (P = 0.0724). In addition, a regression was tested with the untransformed audit fees as a dependent variable since the skewness and kurtosis are within conventional levels of acceptability. The sign of the hypothesis variable (LOCAT) improves to 0.0193 but the risk proxy (ß) was insignificant. The results of other explanatory variables are similar to the ones reported in Table 6, Although the adjusted R^2 increased to approximately 56%.
6. The level of explained variants is in excess of 50%, which is somewhat less than other recent studies. This lower level of explanation can be explained by virtue of the matched-pair sampling, where the size variable will explain less of the variance than where nonmatched samples are used.
7. The tests of constructing and examining histograms of the residuals and normal probability plots of the observed and expected distribution of the residuals did not seriously depart from the assumption of normality. The Kolgomorov-Smirov one-way test could not reject the null hypothesis of normally distributed residuals at any level of significance. A Goldfield-Quandt test was used to check for any heteroscedasticity. The residuals for the overall regression are homoscedastic.

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