Competition in the UK accounting services market

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Abstract

Purpose – The purpose of this paper is to examine the relationship between market structure, competition and pricing in the UK accounting services market. This association is important because mergers amongst the leading firms and the collapse of Arthur Andersen have reduced the number of international accounting firms to four.

Design/methodology/approach – The paper examines concentration ratios (CR) and the fees charged by accounting firms. The data used encompass the period when the number of leading suppliers fell from eight to four.

Findings – FTSE100 consultancy fees increased rapidly in the 1990s. Independence concerns, corporate scandals and additional legislation contributed to a sharp increase in audit fees and a significant decrease in consultancy fees since the turn of the century. The international accounting firms responded to saturation of the FTSE100 market by targeting the small and medium-sized client sectors as avenues for further growth. The audit market is competitive at the initial tender stage but concentration has allowed firms to significantly increase audit fees on repeat engagements.

Research limitations/implications – A number of theoretical and empirical limitations are acknowledged that could further increase the statistical power of the tests.

Practical implications – The study should be of interest to regulatory bodies, auditors, audit clients and academics.

Originality/value – This paper fills a gap in the literature regarding the evolution of CRs and accounting service fees over a significant time frame.

Keywords Accounting, Services, Competitors, United Kingdom

Paper type Research paper

Introduction

Concerns about the effects of increasing concentration levels on price competition in the UK accounting services market were voiced when a small group of suppliers (hereinafter Big Firms) emerged in the 1970s to dominate the audit market. The Monopolies and Mergers Commission (1970, 1976) argued against the profession's restrictions on advertising claiming that they constrained competition and artificially inflated fees. In 1984, the regulatory bodies responded by removing rules that prevented accounting firms from advertising their services and directly soliciting clients for business. The Institute of Chartered Accountants in England and Wales ran a provocative advertising campaign in 1995 that claimed, "it's easier to sleep with a chartered accountant." The aim of these campaigns was to improve competition in the UK audit market.

Between 1989 and 2006, a series of mergers amongst the leading players and the collapse of Arthur Andersen[1] have reduced the number of Big Firms from eight (Arthur Andersen; Arthur Young; Coopers and Lybrand; Deloitte, Haskins and Sells; Ernst and Whinney; Peat Marwick; Price Waterhouse and Touche Ross) to four (Deloitte; Ernst and Young; KPMG and PricewaterhouseCoopers). These mergers prompted renewed concerns about consumer choice and competition. The Office of Fair Trading (2002) noted these anxieties but chose not to investigate because the UK market was undergoing a period of major change. Subsequently, the Audit Quality Forum (2005) concluded that the audit market was competitive at all levels but expressed concerns that conflicts of interest and regulatory issues might severely limit choice. Moreover, the Department of Trade and Industry stated that:

> . . . four major accounting firms dominate the global market for audit services and anecdotal evidence suggests that barriers to entry exist that prevent other firms from competing effectively with these "Big 4". In addition, the threat of collapse as a result of corporate failure or criminal prosecution means that government needs to understand more fully the potential implications if a "Big 4" firm were to exit the whole or part of the audit market or fail and how we might best respond to such a situation (*Accountancy Age*, 2005).

The extent of this apprehension is also evidenced by the recommendations of the Sarbanes-Oxley Act (SARBOX), the Coordinating Group on Audit and Accounting, the Treasury Committee on the Financial Regulation of Public Limited Companies and Oxera (2006). Motivated by these concerns, this paper examines how the structure of the UK audit market has changed since the 1980s and the effect of the evolution of concentration on audit pricing.

Literature review

The traditional industrial economics structure-conduct-performance framework states that the number of competitors is a causal determinant of the degree of price competition, which in turn determines whether firms earn excess profits. Industrial economists contend that prices also depend on the significance of barriers to entry[2] and the strategies of the leading firms (Farrell and Shapiro, 1990). Scholars have long used these arguments to warn about the adverse effects of increases in concentration levels (Stigler, 1968; Scherer and Ross, 1990; Gist and Michaels, 1995).

Following Beattie *et al.* (2003), market concentration and firm performance are assumed to be jointly determined by cost and demand functions. The following six markets are defined based on the level of concentration. A monopoly is a market structure containing one firm that controls 100 percent of the total activity (e.g. number of clients or size of fees). A dominant firm market is a structure containing one company that accounts for 40 to 99 percent of total activity. A tight oligopoly is a market structure containing four firms that have over 60 percent of the total activity. A loose oligopoly market is a structure containing four firms that have less than 40 percent of the total activity. Monopolistic competition is a market structure containing many competitors that have a small degree of market power. Finally, pure competition is a market structure containing many competitors that have no market power. Based on these classifications, concerns have been raised that the audit market is a tight oligopoly structure that might allow firms to exercise "oligopolistic dominance" (Beattie and Fearnley, 1994; European Commission, 1998). In spite of the

unrest about concentration following the PricewaterhouseCoopers and Andersen Deloitte mergers, recent studies of the structure of the UK audit market are scant.

The structure of the UK audit market is interesting given the extensive reorganisation since the 1970s. Market structure is commonly measured using four-, six- or eight-firm concentration ratios (CRs) and/or the Herfindahl Index (*H*) (Briston and Kedslie, 1984; Moizer and Turley, 1989; Beattie and Fearnley, 1994; Pong, 1999). Peel and Roberts (2003) note that the six-firm CR is substantially greater for a sample of companies that have subsidiaries than the corresponding ratio for a sample of independent companies. Other studies show that concentration in the UK audit market increasing as a function of company size (Pong, 1999; Peel and Roberts, 2003).

There is considerable evidence that the concentration of clients and audit fees have increased over time. Matthews and Peel (2003) report that the four-firm CR (CR4) for a sample of UK quoted companies was 23 percent in 1900. CRs had increased to high levels by the 1970s (Burton and Roberts, 1967; Zeff and Fossum, 1967; Rhode *et al.*, 1974; Schiff and Fried, 1976). Table I shows that between the early 1980s to the late 1990s, the CR4 increased from 54 to 79 percent based on audit fee revenues and from 38 to 61 percent based on the number of audits. It is difficult to draw any firm conclusions about the evolution of concentration in the UK because most of these studies are cross-sectional, with longitudinal studies being rare. Oxera (2006) and McMeeking *et al.* (2006) provide two notable exceptions. McMeeking *et al.* (2006) find that concentration grew between 1985 and 2002, with a statistically significant increase coinciding with the reduction from eight to six leading firms. However, the data used by McMeeking *et al.* contains an inconsistent number of companies, despite the well-known advantages associated with panel data research (Hsaio, 1986). The conclusions that one can draw from McMeeking *et al.* are, therefore, limited because changes in concentration may be partially due to variance in the sample size rather than any structural change. Oxera (2006) attribute most of the observed increase in concentration between 1995 and 2004 to the PricewaterhouseCoopers merger and the collapse of Arthur Andersen. However, Oxera (2006) can be criticised for focussing on only two mergers and a ten-year period. The issue of how concentration has evolved for a large panel of UK audit clients is, therefore, an interesting research question.

CRs change when a client voluntarily elects to switch auditor or there is a change in the number of suppliers and/or customers (Beattie and Fearnley, 1994). Auditor realignments will increase concentration if there is an underlying preference to hire a quality-differentiated supplier but may decrease concentration if the regulators enforce the change or there is an overwhelming desire to choose one of the lower priced auditors (Jensen and Meckling, 1976; Dopuch and Simunic, 1980; Shapiro, 1983; Menon and Williams, 1994). FTSE250 clients are increasingly likely to choose one of the Big Firms because they are perceived to offer a better audit, consultancy services and greater insurance against catastrophes than their small and medium-sized counterparts. Since, switching rates are low – around four percent – the increase in CRs can only partially be explained by auditor realignments (Oxera, 2006). Rapid increases in CRs can occur if one of the major players disappears due to a merger or insolvency (Minyard and Tabor, 1991; Wootton *et al.*, 1994; Iyer and Iyer, 1996; Wolk *et al.*, 2001).

Mergers involving Big Firms have come under increasing levels of scrutiny because of their impact on concentration and their potentially damaging effect on pricing. Empiricists address the pricing issue by comparing audit fees before and after

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Time	Paper	Measure	Sample	CR4	CR6	CR8
1982	Moizer and Turley (1989)	Audit fees	FTSE500	0.54	0.69	0.79
1983-1985	Gist and Michaels (1995)	Number of audits	US listed			0.61
1984	Briston and Kedslie (1984)	Number of audits	UK listed	0.38	0.49	0.57
1987	Beattie and Fearnley (1994)	Number of audits	UK listed	0.43	0.55	0.64
1988	Wootton et al. (1994)	Number of audits	NYSE listed	0.60	0.82	0.97
1988	Beattie and Fearnley (1994)	Number of audits	UK listed	0.45	0.57	0.67
1989	Beattie and Fearnley (1994)	Number of audits	UK listed	0.45	0.57	0.68
1990	Lee (1996)	Audit fees	Hong Kong listed	0.84	0.94	0.96
1990	Beattie and Fearnley (1994)	Number of audits	UK listed	0.59	0.72	0.79
1991	Beattie and Fearnley (1994)	Number of audits	UK listed	0.59	0.72	0.79
1991	Beattie and Fearnley (1994)	Number of audits	UK listed	0.59	0.72	0.79
1991	Pong (1999)	Number of audits	UK listed	0.57	0.70	0.79
1991	Pong (1999)	Audit fees	UK listed	0.77	0.89	0.93
1991	Wootton et al (1994)	Number of audits	NYSE listed	0.70	0.98	0.99
1992	Pong (1999)	Number of audits	UK listed	0.58	0.71	0.79
1992	Pong (1999)	Audit fees	UK listed	0.79	0.90	0.94
1993	Pong (1999)	Number of audits	UK listed	0.59	0.73	0.80
1993	Pong (1999)	Audit fees	UK listed	0.80	0.91	0.94
1994	Pong (1999)	Number of audits	UK listed	0.61	0.74	0.82
1994	Pong (1999)	Audit fees	UK listed	0.79	0.92	0.95
1994/1995	Narasimhan and Chung (1998)	Number of audits	UK listed	0.61	0.75	0.63
1994/1995	Narasimhan and Chung (1998)	Number of audits	Canadian listed	0.47	0.58	0.63
1994/1995	Narasimhan and Chung (1998)	Number of audits	Hong Kong listed	0.75	0.91	0.95
1994/1995	Narasimhan and Chung (1998)	Number of audits	Singapore listed	0.72	0.90	0.94
1994/1995	Peel (1997)	Number of audits	UK 1st market	0.63	0.81	
1995	Pong (1999)	Number of audits	UK listed	0.60	0.75	0.82
1995	Pong (1999)	Audit fees	UK listed	0.79	0.92	0.94
1997	Thavapalan et al. (2002)	Number of audits	Australian listed	0.50	0.65	
1997	Thavapalan et al. (2002)	Audit fees	Australian listed	0.71	0.91	
1999	Thavapalan et al. (2002)	Number of audits	Australian listed	0.59		
1999	Thavapalan et al. (2002)	Audit fees	Australian listed	0.79		

Table I.
Supplier concentration in
audit services 1980-2000

a combination(s) but the results are mixed (Iyer and Iyer, 1996; Tai and Kwong, 1997; Ivancevich and Zardkoohi, 2000; Firth and Lau, 2004; McMeeking *et al.*, 2006). When considering a proposed amalgamation, regulators must decide whether the merger will increase the market power of the key players or increase efficiency. Regulators must also gauge the effect of the proposed merger on consumer choice. There is no doubt that a merger between two large firms will reduce the choice of possible auditors. This problem is exacerbated in concentrated industries if there is a strong preference for a quality-differentiated auditor and companies wish to hire a firm that is not associated with one of their competitors (Kwon, 1996; Shepherd, 1997; Beattie *et al.*, 2003). Pong (1999) argues that companies face the dilemma of how to ensure their auditors will not release useful information to their competitors. This raises the problem of whether companies have sufficient alternatives to enable them to hire a high quality, independent auditor at a competitive price (Financial Reporting Council, 2006; Oxera, 2006). Specifically, in order to respond to the call for research on competition in the audit market, this study seeks to address the following questions:

- How has the structure of the UK audit market evolved since 1985?
- Has the change in concentration affected fees?

Methodology

Data were collected from the Standard and Poor's Global Vantage, Extel Company Research and Thomson Analytics Worldscope databases and hand-collected from hard copies of published annual reports, Accountancy magazine, International Financial Statistics and the International Stock Exchange Yearbook. Two samples were created. The first sample consists of the largest 100 listed companies on the London Stock Exchange (FTSE100, hereafter large companies) over the period 1990-2005. FTSE100 CRs are calculated to facilitate a comparison with prior work and because the market structure and audit risks of large companies could have a knock on effect on the whole market.

The FTSE100 index suffers from the problem that inconsistencies in the constituent companies temper the conclusions that one can make from CR calculations[3]. I circumvented these problems by creating a second sample. The second sample consists of FTSE100 companies and a selection of small and medium-sized companies that reported complete data for the entire sample period. Based on the London Stock Exchange classification system, medium-sized companies are defined as the constituents of the FTSE250 index and small companies as FTSE All Share Index companies that are smaller than the FTSE250. Following prior work, financial companies were removed because interpretation of their financial statements and ratios is difficult due to their very different business environments. Moreover, one would expect the risks and costs of completing the audit of a financial company would differ substantially from those of an industrial entity because they operate in a different regulatory framework. These procedures produced a panel dataset of 180 UK listed industrials[4] covering the period 1985-2002, giving $180 \times 18 = 3,240$ firm-year observations. This dataset captures the time-series aspects of audit data over a wider time frame than extant studies.

Market shares are estimated for these samples using the CR and the *H* based on the number of audit clients and fees. The CR measures the proportion of the total activity (number of audit clients or fees) that is accounted for by the biggest firms as follows:

$$CR_n = \sum_{i=1}^{n} S_i$$

where n is the number of large accounting firms and S_i is the size of accounting firm i as a percentage of the size of the market. The Big Firms have an international presence that separates them from small and medium-sized accounting firms. The N-firm concentration ratio (CRN) is, therefore, useful because it shows the dominance of the leading eight (1985-1989), six (1990-1996), five (1997-1999) and four (2000-2002) accounting firms over their smaller counterparts. Following prior work, the CR4 is also computed (Briston and Kedslie, 1984; Moizer and Turley, 1989; Beattie and Fearnley, 1994; Pong, 1999). CR4 shows the proportion of the total activity that is accounted for by the leading four firms in the market. Critics have been more interested in CR4 since 2002 because the demise of Arthur Andersen reduced the number of leading firms to four.

One limitation of the CR is that it ignores the number and size of small- and mid-tier accounting firms. The H provides a more complete measure because it is based on the sum of the squares of the market shares of all firms in the market (Moizer and Turley, 1989, p. 44; Pong, 1999, p. 455):

$$H = \sum_{1}^{M} S_i^2$$

where, M is the total number of firms in the audit market (based on figures reported by the Institute) and S_i is the size of audit firm i as a percentage of the size of the entire market. Moreover, H is used by the US Justice Department to signal merger proposals that require further examination. Since, there are advantages to CRs and H, this study uses both measures of concentration as a check against each other.

The first research question examined in this study is how has the structure of the UK audit market changed since 1985. I address this question by generating and testing two hypotheses. The first hypothesis uses the aforementioned concentration measures and the six market classifications to examine the structure of the FTSE100. The first hypothesis predicts that concentration in the large company market exceeds the levels found in prior studies:

H1. CRs increased in the FTSE100 audit market to reach levels consistent with a tight oligopoly market structure at some point between 1990 and 2005.

The second hypothesis uses these concentration measures to examine the evolution of concentration in the small, medium and large audit client market. The Big Firms are perceived to have advantages over their smaller counterparts in the conduct of blue chip audits. The perception is that the Big Firms have greater technical audit skills; more resources; a wider geographical reach; a greater ability to provide advisory services and more extensive insurance against catastrophic events than small and medium-sized accounting firms (Craswell *et al.*, 1995; Oxera, 2006). If the desire for a Big Firm has grown to such a degree that the FTSE100 index is saturated, the Big Firms may target small and medium-sized clients to expand their portfolios. Based on this conjecture, the second hypothesis predicts that concentration has increased at a faster rate in the small and medium-sized company markets than in the large company market.

H2. Between 1990 and 2005, the rate of growth in concentration of audit activity in the small and medium-sized company markets exceeded the rate of growth in the large company market.

The second research question addressed in this paper is has the change in concentration had a material effect on audit fees. The effects of changes in market structure are incorporated on audit pricing by estimating whether price competition for initial audits varies across time using the panel dataset. Regulators are wary that increased CRs may enhance the market power of the Big Firms and reduce price competition (e.g. European Commission, 1998, 2002). Conversely, the Big Firms may be motivated to merge by the cost savings associated with merger efficiencies. Following the economic principle of Pareto superiority, merger efficiencies[5] are defined as welfare gains associated with the combination of two previously distinct entities. These efficiencies will reduce fees if the combined firm passes these cost savings on to its customers (Sullivan, 2002). Assuming an inverse association between competition and market power, the third hypothesis examines the relationship between concentration and the pricing of initial tenders:

H3. Price competition decreased as concentration levels increased over time.

The third hypothesis is tested using a logarithmic model that has been shown to be robust, demonstrates good explanatory power and survives numerous sensitivity checks (Francis and Simon, 1987; Simon and Francis, 1988; Balachandran and Simon, 1993; Craswell *et al.*, 1995). A considerable body of research shows that the audit fees charged by an accounting firm completing their first audit following a switch of auditors were significantly lower than the audit fees charged by the exiting accounting firm during the 1980s (Francis and Simon, 1987; Simon and Francis, 1988; Pong and Whittington, 1994). For robustness, the following OLS regression is first estimated to test how pricing is affected by an auditor switch:

$$\text{LAF}_i = \alpha_0 + \beta_1 \Delta \text{Aud}_i + \beta_2 \text{Controls}_i + \varepsilon_i \qquad (1)$$

where the subscript i refers to the ith firm (or firm-year), ε_i is the regression residual and the other variables are defined below.

The experimental variables are: LAF = natural logarithm of the audit fee (£'000); ΔAud = 1 if there has been a change of auditor in the year, 0 otherwise. The control variables are: LTA = natural logarithm of total assets (£'M); sub = square root of the number of subsidiaries; current = ratio of current assets to current liabilities; loss = 1 if an operating loss was reported in prior 3 years, 0 otherwise; quick = ratio of current assets less stock to current liabilities; DTA = ratio of long-term debt to total assets; ROI = ratio of earnings before interest and tax to total assets; Foreign = proportion of subsidiaries that are foreign operations; YE = 1 if the fiscal year end is between December and March inclusive, 0 otherwise.

Following earlier work, the vector of control variables contains proxies for client size (assets), litigation risk (long-term debt to assets, return on investment, current and quick ratios) and complexity (domestic and foreign subsidiaries ratios) that capture most of the work-related variability in audit fees (Francis and Simon, 1987; Simon and Francis, 1988; Beatty, 1993; Anderson and Zeghal, 1994).

To assess the effects of concentration on audit pricing, the number of clients is used to incorporate *H* and *H*ΔAud into the regression model:

$$\text{LAF}_i = \alpha_0 + \beta_1 \Delta\text{Aud}_i + \beta_2 H + \beta_3 \text{Controls}_i + \varepsilon_i \tag{2}$$

$$\text{LAF}_i = \alpha_0 + \beta_1 \Delta\text{Aud}_i + \beta_2 H + \beta_3 H\Delta\text{Aud}_i + \beta_4 \text{Controls}_i + \varepsilon_i \tag{3}$$

The control variables and ΔAud are specified above and the experimental variables are: H = the Herfindahl index based on the number of audit clients; $H\Delta$Aud = the value of H based on the number of audit clients if there has been a change of auditor in the year, 0 otherwise.

Results
Descriptive statistics
Table II presents descriptive statistics for the panel of 180 audit clients over the period 1985 to 2002. Following earlier work, the audit fee, non-audit fee and client size variables are presented in logarithmic form and the complexity variable in square root form to reduce skewness and prevent the largest clients from excessively affecting the results. Table II shows that the transformed variables are well behaved and the descriptive statistics are similar to the figures the financial accounting literature would lead one to expect[6]. The leading four and the Big Firms account for 0.64 and 0.76 of the number of audits between 1985 and 2002. The average value of the H is 0.19 and the average rate of auditor rotation is 0.12. It is highly unlikely that the results are severely affected by multicollinearity because the correlation coefficients are lower than the critical value (0.8) suggested by Judge (1988, p. 868) and variance inflation factors are

	Mean	Median	St. dev.	Min	Max
LAF	5.01	4.85	1.26	2.27	9.34
LTA	11.73	11.57	1.67	5.87	18.85
Sub	3.57	3.26	1.89	0.00	14.00
Current	1.59	1.41	0.85	0.02	8.98
Quick	0.97	0.85	0.77	0.01	8.86
DTA	0.13	0.07	0.19	0.00	3.61
ROI	0.11	0.11	0.12	−1.35	0.69
Foreign	0.25	0.19	0.27	0.00	1.00
YE	0.69	1.00	0.46	0.00	1.00
Loss	0.16	0.00	0.35	0.00	1.00
CRN	*0.76*	1.00	0.42	0.00	1.00
CR4	*0.64*	1.00	0.41	0.00	1.00
H	*0.19*	0.00	0.04	0.00	1.00
ΔAud	*0.124*	0.00	0.25	0.00	1.00

Notes: LAF = natural logarithm of audit fees; LTA = natural logarithm of total assets (£'000); sub = square root of the number of subsidiaries; current = ratio of current assets to current liabilities; quick = ratio of current assets less stock to current liabilities; DTA = ratio of long-term debt to total assets; ROI = ratio of earnings before interest and tax to total assets; foreign = proportion of subsidiaries that are foreign operations; YE = 1 if fiscal year end between December and March inclusive, 0 otherwise; loss = 1 if operating loss reported in prior three years, 0 otherwise; CR4 = four firm CR based on the number of audit clients; CRN = CR of the Big Firms based on the number of audit clients; H = Herfindahl Index based on the number of audit clients; ΔAud = 1 if there has been a change of auditor in the year, 0 otherwise; $H\Delta$Aud = the value of H based on the number of audit clients if there has been a change of auditor in the year, 0 otherwise

Table II.
Descriptive statistics for the panel dataset

far smaller the conventional cut-off point of 10 (Hair *et al.*, 1998, p. 193). Moreover, I excluded variables, examined different models and considered prior beliefs about variable estimates and found that the results are not likely to be contaminated by multicollinearity (Gujarati, 1999). Likewise, the results of the Goldfield and Quandt (1965) and Breusch and Pagan (1979) tests indicate that heteroskedasticity is not a major problem. Since, there is some evidence of heteroskedasticity, t-values are based on corrected standard errors using the White (1980) procedure.

Trends in UK concentration
Table III reports the level and growth in the rate of inflation and fees paid by the FTSE100 between 1990 and 2005. Since, the disclosure of consultancy fee information was only mandated in the financial statements of UK companies from September 1992[7], non-audit service fees are reported from 1993. Table III shows that FTSE100 audit fees fell in real terms during the 1990s. Inflation adjusted audit fees fell by 0.065 in 1991, 0.064 in 1992, 0.001 in 1994, 0.109 in 1995, 0.067 in 1997, 0.029 in 1998 and 0.012 in 1999. The only real audit fee increases were 0.089 in 1993 and 0.031 in 1996. By contrast, following the 0.009 fall in 1994, consultancy fees rapidly increased in real terms in the 1990s. Non-audit service fees grew by 0.376 in 1995, 0.095 in 1996, 0.246 in 1997, 0.074 in 1998 and 0.459 in 1999. This pattern continued into the new millennium with a 0.092 fall in real audit fees and a 0.196 hike in real non-audit fees. Table III also shows the total remuneration (audit plus non-audit service fees) paid to auditors by FTSE100 clients. Inflation adjusted total auditors fees fell by 0.004 in 1994 then increased by 0.074 in 1995, 0.062 in 1996, 0.087 in 1997, 0.03 in 1998, 0.264 in 1999 and 0.105 in 2000. These findings are attributed to auditors competing fiercely over the price of assurance and using lucrative consultancy work to cross subsidize the audit service (Financial Reporting Council, 1991; Chartered Accountants Joint Ethics Committee, 1992; Singleton-Green and Buckingham, 2000).

Audit and non-audit fees increased in real terms in 2001 before the dramatic events at Enron and WorldCom brought the accounting profession to the forefront of political debate. Although there was little change in audit and consultancy fees in 2002, FTSE100 clients subsequently paid much higher audit fees and lower consultancy service fees. In real terms, audit fees increased by 0.136 in 2003, 0.035 in 2004 and 0.193 in 2005 and non-audit fees fell by 0.295 in 2003, 0.285 in 2004 and 0.134 in 2005. Inflation adjusted total auditors remuneration fell by 0.187 in 2003, 0.174 in 2004 and 0.062 in 2005. The audit fee hike is attributed to the additional audit effort needed to satisfy the requirements of SARBOX and the International Financial Reporting Standards (Fisher *et al.*, 2005; Neveling, 2006). Regulators are also interested in the question of whether the increased audit fees are due to the exercise of power by the increasingly dominant Big Firms. The reduction in consultancy fees is the result of the concerns over auditor independence, the SARBOX restrictions on the provision of consultancy services to audit clients and the sale of consultancy arms by some of the major accounting firms (Zea, 2002; Harding, 2004; Fisher *et al.*, 2005).

Table IV reports market shares of the leading accounting firms based on the number of FTSE100 audit clients between 1990 and 2005. The largest four firms (Coopers and Lybrand, Ernst and Young, KPMG and Price Waterhouse) accounted for 0.865 of the FTSE100 audits in 1990. The PricewaterhouseCoopers and the Andersen Deloitte mergers increased CR4 to 0.905 and 0.99, respectively. CRs continued to grow

Table III.
Audit and consultancy fees for the FTSE100 clients and the index of retail prices

Year-end	RPI (percent)	RPI growth (percent)	Audit fees (£M)	Change in audit fees (percent)	Change in RPI adjusted audit fees (percent)	Non audit fees (£M)	Change in non audit fees (percent)	Change in RPI adjusted non audit fees (percent)	Total auditors fees (£M)	Change in total auditors fees (percent)	Change in RPI adjusted total auditors fees (percent)
1990	126.1	9.5	179.9								
1991	133.5	5.9	178.8	−0.6	−6.5						
1992	138.5	3.7	174.0	−2.7	−6.4						
1993	140.7	1.6	192.2	10.5	8.9	117.3			309.5		
1994	144.1	2.4	196.6	2.3	−0.1	119.1	1.5	−0.9	315.7	2.0	−0.4
1995	149.1	3.5	182	−7.4	−10.9	168	41.1	37.6	350	10.9	7.4
1996	152.7	2.4	192	5.5	3.1	188	11.9	9.5	380	8.6	6.2
1997	157.5	3.1	185	−3.6	−6.7	240	27.7	24.6	425	11.8	8.7
1998	162.9	3.4	186	0.5	−2.9	266	10.8	7.4	452	6.4	3.0
1999	165.4	1.5	186.5	0.3	−1.2	392.2	47.4	45.9	578.2	27.9	26.4
2000	170.3	3.0	175	−6.2	−9.2	481	22.6	19.6	656	13.5	10.5
2001	173.3	1.8	215	22.9	21.1	628	30.6	28.8	843	28.5	26.7
2002	176.2	1.7	212	−1.4	−3.1	636	1.3	−0.4	848	0.6	−1.1
2003	181.3	2.9	247	16.5	13.6	467	−26.6	−29.5	714	−15.8	−18.7
2004	186.7	3.0	263	6.5	3.5	348	−25.5	−28.5	611	−14.4	−17.4
2005	192.0	2.8	321	22.1	19.3	311	−10.6	−13.4	632	−3.4	−6.2

Notes: The table shows the retail price index of all items (CHAW), the annualised growth rate in the index of retail prices (CZBH percentage change in the index of all items over twelve months), fees relating to audit and non-audit services in £M, the annualized growth rate in audit fees and the annualized growth rate in non-audit service fees. The 1991-1992 audit fee includes an amount converted from Hong Kong $ in relation to HSBC. Inflation rates were collected from the National Statistics Office and exchange rates were collected from the International Financial Statistics

	Market share of number of audits (percent)								
Year-end	AA	CL	EY	KPMG	PW	PWC	TR/D	Others	CR4
1990	2.5	29	19.5	17.5	20.5		7	4	*86.5*
1991	2.5	27.5	19.5	20	22.5		5	3	89.5
1992	3	24.5	19	20	24.5		6	3	88
1993	3	25	19	21	24.5		5	2.5	89.5
1994	3	25	19	21	24.5		4	3.5	89.5
1995	5	28	18	22	21		4	2	89
1996	6	27	19	20	19.5		6	2.5	85.5
1997	5	25	17.5	23.5	19.5		8	1.5	85.5
1998	9		12	23		*46.5*	8	1.5	*90.5*
1999	4		12.5	22.5		*49.5*	10.5	1	95
2000	5		11	23		*48.5*	12.5	0	95
2001	8		13.5	23		*45.5*	10	0	92
2002	7		15	24.5		*41.5*	12	0	93
2003			15.5	23		*42.5*	18	1	*99*
2004			16	20.5		*43.5*	20	0	*100*
2005			18	20.5		*42.5*	19	0	*100*

Notes: AA denotes Arthur Andersen (latterly Andersen); CL denotes Coopers and Lybrand (formerly Coopers and Lybrand Deloitte in the UK); EY denotes Ernst and Young; KPMG denotes KPMG; PW denotes Price Waterhouse; PWC denotes PricewaterhouseCoopers; TR denotes Touche Ross; D denotes Deloitte; others denotes any of the small and medium-sized accounting firms and CR4 is the CR4. Price Waterhouse and Coopers and Lybrand merged in 1997 to form the firm that is known today as PricewaterhouseCoopers. Deloitte completed a takeover of most of the UK Andersen offices in 2002 and the combined firm now sign off audits under the name Deloitte

Table IV.
Market shares based on
the number of FTSE100
audits

and in 2004 the Big Four accountancy firms conducted the audits of all of the FTSE100 companies. Blue chip companies hire the Big Firms because these auditors are perceived to offer international coverage, the best methodology and a strong reputation for quality. The reluctance of FTSE100 companies to hire medium-sized auditors (the "IBM effect") provides the Big Firms with considerable bargaining power (Oxera, 2006). Although some clients re-evaluated their arrangements after the PricewaterhouseCoopers merger, the market share of the combined firm exceeded 40 percent from 1998 onwards. Consistent with hypothesis *H1*, this result is consistent with a dominant firm market structure and is greater than those criticised in the prior literature.

Concentration by client size
I now turn my attention to the importance of size by partitioning the panel dataset into four quartiles based on total assets. Although a few companies move between quartiles, the number of companies in each size partition is similar and the following results are not materially different if the companies that switch partitions are excluded.

Table V presents market share estimates based on the number of audit clients. The first three columns report the results for the panel dataset and the remaining columns for the size quartiles. The left hand columns present results for the panel dataset and the central and right hand columns for the size-partitions. Looking first at the full panel of data, the CRN results suggest that the mergers contributed to an increase in the market share of the international firms from 0.62 in 1985 to 0.82 in 2002. Over the same

Year	Full sample 180 audit clients			Assets ≤ £40M 45 audit clients		£40-£100M 45 audit clients		£100-£350M 45 audit clients		Assets > £350M 45 audit clients	
	CRN	CR4	H	CRN	CR4	CRN	CR4	CRN	CR4	CRN	CR4
1985	0.62	0.45	0.17	0.46	0.30	0.65	0.45	0.70	0.46	0.76	0.60
1986	0.63	0.44	0.17	0.45	0.29	0.61	0.44	0.72	0.45	0.75	0.60
1987	0.64	0.45	0.17	0.44	0.31	0.63	0.44	0.74	0.45	0.77	0.62
1988	0.68	0.49	0.17	0.55	0.34	0.61	0.46	0.78	0.50	0.80	0.66
1989	0.71	0.53	0.17	0.61	0.40	0.61	0.49	0.77	0.55	0.85	0.68
1990	0.72	0.62	0.18	0.64	0.50	0.66	0.60	0.76	0.66	0.84	0.73
1991	0.73	0.62	0.18	0.65	0.50	0.69	0.61	0.76	0.66	0.83	0.74
1992	0.75	0.64	0.18	0.63	0.50	0.71	0.63	0.80	0.67	0.86	0.75
1993	0.76	0.65	0.18	0.64	0.52	0.73	0.64	0.82	0.68	0.87	0.76
1994	0.79	0.68	0.18	0.67	0.53	0.73	0.67	0.87	0.73	0.90	0.80
1995	0.81	0.69	0.18	0.68	0.54	0.77	0.66	0.87	0.72	0.92	0.84
1996	0.81	0.70	0.19	0.69	0.61	0.78	0.68	0.88	0.68	0.92	0.83
1997	0.81	0.69	0.19	0.70	0.61	0.77	0.65	0.89	0.70	0.91	0.83
1998	0.83	0.70	0.21	0.72	0.62	0.78	0.66	0.90	0.71	0.94	0.83
1999	0.84	0.79	0.21	0.72	0.69	0.79	0.75	0.90	0.83	0.95	0.88
2000	0.83	0.78	0.21	0.72	0.68	0.78	0.74	0.89	0.82	0.95	0.88
2001	0.82	0.76	0.21	0.70	0.67	0.77	0.73	0.88	0.79	0.94	0.85
2002	0.82	0.77	0.22	0.70	0.68	0.77	0.73	0.87	0.80	0.94	0.85

Notes: The table shows the mean values of the CRN, the CR4 and H based on the number of audit clients. The left hand columns document CRs for the full sample of audit clients from 1985 to 2002. The right hand columns show CRs for the size-partitioned sub-samples of clients

Table V.
Auditor CRs for the panel dataset based on the number of audit clients

period, CR4 increased from 0.45 to 0.77 and H from 0.17 to 0.22. In percentage terms, these results correspond to a 32 percent CRN increase, a 71 percent CR4 increase and a 29 percent H increase. The partitioned findings indicate that CRs were greatest for the companies in the upper quartile, implying that large audit clients are more likely to hire one of the international accounting firms than their smaller brethren. Between 1985 and 2002, CRN increased by 0.24 for companies in the lower quartile, 0.12 for companies between the lower quartile value and the median, 0.17 for companies between the median and the upper quartile value and 0.18 for companies in the upper quartile of clients. Starting from the smallest and ending with the largest companies, CRN increased in percentage terms by 52 percent, 18 percent, 24 percent and 24 percent. Similarly, CR4 increased by 0.38 for companies in the lower quartile, 0.28 for companies between the lower quartile value and the median, 0.34 for companies between the median and the upper quartile value and 0.25 for companies in the upper quartile of clients. In percentage terms, CR4 increased by 127 percent, 62 percent, 74 percent and 42 percent for the four quartiles, respectively. Unreported findings show that these results are even more pronounced if CRs are estimated based on audit fee or non-audit fee revenues. Consistent with hypothesis $H2$, these results suggest that the international audit firms are increasingly targeting small and medium-size companies because the large client market is close to saturation. These findings support the recent evidence that the Big Four dominate all of the UK markets except the Alternative Investment Market (Quick, 2006; Oxera, 2006).

The relationship between market structure and fees
The issue I now turn to is the relationship between concentration and audit fees. The results of the audit pricing regressions (models 1-3) for the full sample and size-partitioned sub-samples of the panel dataset are reported in Table VI. The first two columns in Panel A of Table VI and all of the columns in Panel B report the results of model 1. These estimations exclude the market share measures to facilitate a comparison with the prior literature. The results of models 2 and 3 are documented in the second and third pairs of columns in Panel A of Table VI, respectively. These models are significant at the $p < 0.01$ level and exhibit strong explanatory power (R^2 generally around 80 percent). All of the control variables possess the anticipated signs and the majority are significant at the $p < 0.05$ level.

Consistent with earlier work, the ΔAud coefficient for the panel data estimation (model 1) is -0.063. This implies that the average fee discount following a change in auditor is 6.5 percent[8]. Although market concentration is high, fee cutting seems to take place following a change in auditor, consistent with strong price competition in the initial tender market for audit services (Oxera, 2006). Unreported results suggest that price competition is strongest for the smallest quartile and weakest for the largest quartile of clients. The increasing concentration levels lead me to the question of whether price competition has fallen between 1985 and 2002.

The results of the annual initial audit pricing estimations (model 1) are documented in Panel B of Table VI. I do not disclose the estimates for the control variables because these are not materially different from those reported in Panel A. Again using the above inversion factor, the ΔAud coefficient is -0.198 in 1986, -0.202 in 1987 but is insignificantly different from zero in all other years. Fee cutting following an auditor switch seems to take place in 1986 and 1987, but not from 1988 to 2002. One possible

Panel A	Model 1		Model 2		Model 3	
Intercept	− *1.479*	(20.68)	− *1.788*	(8.26)	− *1.634*	(10.11)
LTA	*0.484*	(75.48)	*0.484*	(65.03)	*0.483*	(75.20)
Sub	*0.240*	(41.34)	*0.243*	(36.16)	*0.242*	(41.14)
Current (-)	− *0.130*	(7.55)	− *0.130*	(5.67)	− *0.130*	(7.55)
Quick	*0.101*	(5.20)	*0.099*	(2.38)	*0.101*	(5.22)
DTA	*0.054*	(4.23)	*0.053*	(1.98)	*0.053*	(4.10)
ROI (-)	− 0.016	(0.92)	− *0.138*	(2.09)	− 0.016	(0.96)
Foreign	0.001	(0.05)	*0.464*	(11.78)	0.002	(1.02)
YE	*0.100*	(5.25)	*0.098*	(5.15)	*0.098*	(5.17)
Loss	0.001	(0.68)	0.001	(0.70)	0.001	(0.69)
∆Aud (-)	− *0.063*	(3.06)	− *0.105*	(3.11)	− *0.236*	(2.23)
H			*1.725*	(2.52)	0.901	(1.12)
H∆Aud					*2.570*	(1.97)
N	3,060		3,060		3,060	
F	1727.5*		1572.9*		1443.1*	
R^2	0.80		0.80		0.80	

Panel B									
Year	1986	1987	1988	1989	1990	1991	1992	1993	1994
∆Aud (-)	− *0.198*	− *0.202*	− 0.083	− 0.005	− 0.083	− 0.021	− 0.091	− 0.079	− 0.109
	(2.10)	(2.34)	(1.10)	(0.06)	(1.20)	(0.23)	(0.87)	(0.79)	(1.07)
N	180	180	180	180	180	180	180	180	180
F	129.9*	105.0*	140.3*	131.2[a]	141.8*	151.3[a]	138.3*	175.7*	154.4*
R^2	0.80	0.80	0.81	0.80	0.80	(0.80)	0.78	0.83	0.81
Year	1995	1996	1997	1998	1999	2000	2001	2002	
∆Aud (-)	− 0.071	− 0.112	− 0.187	− 0.126	− 0.062	− 0.253	− 0.053	0.045	
	(0.91)	(1.14)	(1.67)	(1.21)	(0.58)	(1.75)	(0.36)	(0.26)	
N	180	180	180	180	180	180	180	180	
F	195.6*	143.5*	154.8*	147.9[a]	104.8*	108.4[a]	98.4*	87.9*	
R^2	0.84	0.82	0.82	0.81	0.84	0.80	0.86	0.85	

Notes: Panel A: $LAF_i = \alpha_0 + \beta_1 \Delta Aud_i + \beta_2 Controls_i + \varepsilon_i$, (1);
$LAF_i = \alpha_0 + \beta_1 \Delta Aud_i + \beta_2 H + \beta_3 Controls_i + \varepsilon_i$, (2);
$LAF_i = \alpha_0 + \beta_1 \Delta Aud_i + \beta_2 H + \beta_3 H \Delta Aud_i + \beta_4 Controls_i + \varepsilon_i$, (3).
Panel B: $LAF_i = \alpha_0 + \beta_1 \Delta Aud_i + \beta_2 Controls_i + \varepsilon_i$, (1).
*significant at the 1 percent level. The coefficients shown in italic are significant at the 5 percent level. The first figure in each panel shows the parameter estimate and the second (parenthetical) figure the *t* statistic for each variable. The dependent variable is the natural logarithm of the audit fee. Panel A includes the same control variables in the annual regressions as in Panel B but does not report these for conciseness. The expected sign is positive except where shown in parenthesis. LTA – natural logarithm of total assets (£M); sub – square root of the number of subsidiaries; current – ratio of current assets to current liabilities; quick – ratio of current assets less stock to current liabilities; DTA = ratio of long-term debt to total assets; ROI = ratio of earnings before interest and tax to total assets; foreign – proportion of subsidiaries that are foreign operations; YE – 1 if the fiscal year end is between December and March inclusive, 0 otherwise; loss – 1 if an operating loss was reported in prior 3 years, 0 otherwise; *H* – the Herfindahl Index based on the share of the number of clients; ∆Aud – 1 if there has been a change of auditor in the year, 0 otherwise; $H\Delta Aud$ = the value of Herfindahl index based on the number of audit clients if there has been a change of auditor in the year, 0 otherwise

Table VI.
OLS regression models of log fees against auditor switch and concentration dummies

explanation for the discrepancy in the findings is that it is driven by volatility in the number of switches over time. Sensitivity analysis shows that although the proportion of auditor switches varies, the rate of auditor rotation is lower in 1986 and 1987 than most other years. This implies that the decrease in the level of price competition for

initial tenders cannot be attributed to volatility in the rate of auditor rotation. This brings me to the structure-conduct relationship.

The results of my estimation of the relationship between market concentration and the auditor switch dummy are documented in the central and right hand columns of Table VI Panel A. The second regression (model 2) includes ΔAud and H based on the number of audit clients. The H coefficient is 1.725 and the ΔAud coefficient is -0.105. These findings suggest that clients must pay a significant audit fee premium on repeat audits due to market concentration but receive an average fee discount of about 11.1 percent following a switch. The third regression (model 3) includes ΔAud, H and an interaction variable, $H\Delta$Aud, that takes the value of the H if the client has switched auditors this year and 0 otherwise. The ΔAud coefficient is -0.236, the H coefficient is 0.901 and the $H\Delta$Aud coefficient is 2.570. These results suggest that concentration increase fees, but not significantly, clients receive an average fee discount of 27 percent following an auditor switch and clients must pay a significant fee premium if concentration increases and there has been a switch. It is worth noting that the main cause of an auditor switch that coincides with an increase in auditor concentration is a merger between accounting firms. These results suggest that the audit market is competitive at the initial tender level but audit fees increase as a result of merger induced increases in concentration.

Sensitivity analysis and limitations

The sensitivity of the results have been tested using a number of methods. My checks suggest the models are well specified from an econometric perspective. First, since audit fees and CRs are positively associated with time, the exclusion of year dummies could lead to inconsistent estimates. I tested this by adding dichotomous year dummy variables to the three models. The coefficients of the year variables were all insignificant and the experimental variables were stable suggesting that their exclusion did not have a material effect on the main results. Second, although there is considerable evidence that audit fees are positively associated with auditor reputation, ΔAud cannot identify the quality of the audit firms. A brand name auditor variable and dichotomous dummies that indicate a switch between Non Big Firms, from a Non Big Firm to a Big Firm (upgrades), and between Big Firms were therefore added to the three models. Unreported results indicate that companies are willing to pay a premium to secure the services of a brand name firm but this has no material impact on the main findings. Finally, I sequentially excluded individual accounting firms, industry sectors and companies from the analysis but found no evidence to suggest that any one entity or market segment was driving the results[9].

The results of this study are subject to a number of limitations. First, it could be difficult to generalize the findings to other jurisdictions because the audit market and economic conditions vary across countries, samples and time periods. Owing to the lack of available data and in the interest of economy, this study does not identify whether accounting firms have generated industry specialist reputations (DeFond *et al.*, 2000; Ferguson *et al.*, 2003; Francis *et al.*, 2005). The study is also unable to isolate specific market structural effects such as a merger from other exogenous influences. Other problems are that the auditor switch model cannot identify audit tenders that do not lead to an auditor switch (but could result in reduced fees) nor whether a change in auditor is associated with exogenous factors that might lead to increased audit fees. A further

problem is that the effects of the Deloitte merger with Andersen cannot be fully appreciated because of the limited amount of available data at the time of collection. A final limitation is the essentially *ad hoc* nature of the regression model (although this has been widely used in prior work and shows strong explanatory power).

Summary and conclusions

This paper contributes to the literature by investigating the evolution of fees and market concentration over a longer time frame than prior studies. FTSE100 results show that consultancy fees increased rapidly but audit fees were squeezed in the 1990s. However, the Big Firms changed their pricing strategies after the turn of the century. FTSE100 audit fees increased significantly and non-audit service fees have fallen since 2002. This is consistent with the post-Enron restructuring of the major accounting firms and the increased reporting costs associated with the requirements of the SARBOX legislation.

CRs have increased in the FTSE100 market to levels that are consistent with a dominant firm structure and exceed those criticised in the extant literature. The international accounting firms have responded to the saturation of the large client market by expanding their portfolios of small and medium-sized clients. Price competition is significant at the initial tender stage but audit fees have increased as a result of rising concentration levels. These findings imply that regulators should be wary of any further merger proposals because of the increased potential for price collusion.

The Big Firms dominate the FTSE100 and the FTSE250. Large and medium-sized companies increasingly desire the cachet effect of a Big Firm rather than wanting to be seen as using an auditor outside the Big Four. The audit committees of blue chip companies perceive that the Big Firms have the most resources, geographical reach and best technical ability to conduct audits and are well placed to offer insurance against bankruptcy or loss of reputation and provide additional consultancy services (Moizer, 1997; Oxera, 2006). This desire for reputation and the series of mergers amongst the leading players has enabled the leading players to accumulate a significant amount of market power. Companies that are unhappy may experience difficulties in replacing their auditor if one Big Firm is completing the audit of a competitor and another does not specialize in your sector. Without some form of government intervention, this situation is unlikely to improve in the near future because of the barriers to entry are huge and there is no evidence that the mid tier firms are catching up to the international firms. This raises the issue of how to improve competition in the UK audit market.

Improving choice in the audit market is not straightforward. If the mid-tier auditors are unable to offer viable alternatives to the Big Firms then one must look at fresh ideas. Competition could be gradually improved if the government introduced tax or other incentives to encourage the growth of mid-tier auditors. Radical forms of market intervention would be to amend legislation to introduce other sources of audit to the market, such as the Comptroller and Auditor General, HM Revenue and Customs, National Audit Office or financial services groups. This would at least offer an "auditor of last resort" to prevent the scenario that a credible firm cannot be identified. Compulsory auditor rotation or mandatory joint audit engagements might encourage firms to think beyond the Big Firms but the downside is that costs would undoubtedly increase. Another option is the mandatory division of large firms. For example, Japan's

Financial Services Agency is seriously considering breaking-up Chuo Aoyama PwC (*Accountancy Age*, 2006). However, breaking up one or more accounting firms on a global sale would be extremely difficult to achieve because the international reach of the Big Firms means that this action would require the consensus of the world's governments and/or regulators. It is clear that the regulatory bodies must seriously consider the issues of competition and consumer choice because further consolidation or collapse of a Big Firm would have serious implications for choice in the UK audit market (Oxera, 2006). Although government intervention is an extreme solution to this problem, it is difficult to imagine how consumer choice can be improved without some form of market intervention.

Notes

1. Successful mergers involving top tier firms include: in 1989 Arthur Young with Ernst and Whinney; in 1990 Deloitte Haskins and Sells with Coopers and Lybrand (Touche Ross in the US); in 1997 between Price Waterhouse and Coopers and Lybrand; and in 2002 between Andersen and Deloitte.

2. Entry barriers to the accounting profession include the need for firms to have a strong reputation for quality and the need for deep pockets to provide assurance against the risk of material error that would lead to bankruptcy. Entry barriers at the individual level include the requirement to complete professional examinations and the time spent with a practicing firm. Although these restrictions aim to prevent unscrupulous service providers from exploiting the information advantage they hold over other stakeholders, there are no guarantees that this strikes the correct balance between protection and the consumer benefits from competition. Restrictions on supply are likely to increase prices, limit access and consumer choice and result in poorer value for money than would occur in a competitive market.

3. The FTSE100 index is inconsistent because of acquisitions, insolvencies and variations in the growth rate of the component companies.

4. The 180 industrials were drawn from a wide range of different industry sectors. The oil and gas extraction activities and motor vehicle manufacturing and parts sectors contain the greatest number of companies. Sensitivity checks indicate that there is no evidence that companies are drawn extensively from any industry sector or that any industry group drives the results.

5. Examples of these merger efficiencies are the cost savings associated with the rationalization of production, economies of scale, technological advances, purchasing economies and/or reduction of slack.

6. The main results are not materially different if other proxies (e.g. the natural logarithm of sales revenue) or transformations (e.g. ranked regression or normal scores) are used.

7. Accountancy began documenting the biannual audit fees of the FTSE100 companies in 1989 and non-audit fees in 1992. UK companies have long been required to report their audit fees in the annual reports (Companies Act, 1967). The requirement for UK listed companies to disclose the revenues received from audit clients in relation to consultancy services became mandatory in 1992.

8. Allowing for any effort-related variances in fees, the initial audit fee discount is the proportionate decrease in fees associated with engaging a new firm as the auditor. Once the logarithmic transformation is reversed, the discount can be found from the estimate of the Δ Aud coefficient as follows: $e^{\beta_2} - 1$. See Kennedy (2003) for further details.

9. I thank the anonymous reviewers for raising these points.

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