The effect of family control on audit fees during financial crisis

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Abstract

Purpose – The purpose of this study is to empirically examine the effect of family involvement in ownership, management and directorship on audit fees during the crisis and non-crisis periods.

Design/methodology/approach – Following Anderson and Reeb (2003), this paper uses a two-way fixed effect model to examine the impact of family control on audit fees in crisis and non-crisis periods. The fixed effects include dummy variables for each year and each industry code in the sample.

Findings – This paper finds that during normal economic periods, family firms pay lower audit fees relative to non-family firms because of the incentive alignment or monitoring effect. While, during crisis periods, family firms pay higher audit fees because of the shareholder expropriation effect.

Research limitations/implications – The results reported in this paper have both practical and policy implications for the demand and supply of audit services to firms having different ownership structures.

Originality/value – This is the first study of its kind to examine the effect of family ownership and involvement on audit fees during the crisis period.

Keywords Audit fees, Corporate governance, Family firms, Family involvement, Financial crisis, UK listed firms

Paper type Research paper

1. Introduction

This paper investigates the effect of the financial crisis on audit fees in UK family firms. Specifically, it examines whether the demand/supply of assurance services in family firms changes during and in the aftermath of the financial crisis. Using a sample of firms in the UK over the period 2005-2013 and relying on agency theory and using insights from the audit pricing literature, this paper documents a positive association between family control, in terms of family involvement in ownership, management and directorship and audit fees during the crisis period. Nonetheless, during normal economic periods, there is a negative association between family control and audit fees.

Audit fees have been a subject for academic research over the past decades. Prior research documents that audit fees are a function of client and audit firm attributes, in addition to client size and the complexity of its operations. The existing literature also documents inconclusive evidence on the association between audit fees and family control. For instance, Ho and Kang (2013) showed that the family involvement in management and board positions alleviates owner–manager conflicts, leading to lower demand for highly qualified auditors and, therefore, lower audit fees. Ben Ali and Lesage (2014) also showed that family ownership and the presence of a controlling family shareholder are negatively related to audit fees in US-listed firms. However,

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Fan and Wong (2005) and Khan and Subramaniam (2012) find that auditors exert high efforts and charge family firms higher audit fees to account for family expropriation and poor monitoring of management.

Similarly, prior research on the association between audit fees and financial crisis is contradictory (Maher *et al.*, 1992; Xu *et al.*, 2011; Zhang and Huang, 2013; Krishnan and Zhang, 2014; Alexeyeva and Svanström, 2015; Chen *et al.*, 2018). For instance, Alexeyeva and Svanström (2015) find that auditors charged greater audit fees during the 2008 crisis relative to the pre-crisis period. Moreover, audit fees continued to increase during the post-crisis period, with auditors paying heed to firms' leverage and losses. In the same vein, Xu *et al.* (2011) find that auditors charge higher audit fees during the 2008 financial crisis as a result of additional audit efforts applied to account for increases in risk. However, other studies showed that audit fees may decline during an economic crisis (Krishnan and Zhang, 2014; Chen *et al.*, 2018) because of increased competition among auditors (Abdel-Kalik, 1990; Maher *et al.*, 1992).

This study extends the literature by proposing that the governance needs of firms depend on firm-specific conditions (Leung *et al.*, 2014), which have not been controlled for in prior literature. One of these conditions is ownership structure (family vs non-family), which is considered a key determinant of corporate governance effectiveness and the failure to control for such determinant may result in false associations and inaccurate conclusions. Relying on agency theory, and using insights from the audit pricing literature, this study argues that during normal economic periods, family directors have higher incentives to monitor their business activities to alleviate conflicts of interest between owners and managers, enhance firm performance and maintain a good reputation (incentive alignment effect). Hence, family directors somehow act as substitutes for external auditors and, therefore, reduce audit fees paid by their firm. Nonetheless, during crisis periods, family directors may attempt to extract personal benefits from minority shareholders as the family's wealth may be threatened by the financial shock (expropriation effect). Hence, external auditors would have to put in additional monitoring efforts to mitigate the adverse outcomes of the family's conduct and protect the interests of minority shareholders.

This paper contributes to the literature in various ways. First, as aforementioned, it is the first paper of its kind to examine the effect of family involvement in ownership, management and directorship on audit fees during a crisis period. The 2008-2009 financial crisis has been regarded as the most important ever since the Great Depression of 1929-1933. The crisis considerably increased client firm business risk, which increased the doubt in the firms' ability to carry on as a going concern (Xu *et al.*, 2011). Audit firms had a controversial role in the 2008-2009 financial crisis. They were greatly criticized for failing to detect misstatements and risks in some large firms. Many firms that received unqualified audit reports during the crisis had failed (Sikka, 2009, p. 868). Second, the paper uses data from UK public firms listed on the London Stock Exchange over the period 2005-2013. The association between family control (involvement in ownership, management and directorship) and audit fees is still not explored in the UK context. According to Poutziouris (2011), family businesses in the UK account for 75 per cent of all businesses. The dominance of family ownership in the UK provides an interesting opportunity to study the effect of family control on audit fees. Moreover, the UK exhibits a voluntary "comply or explain" governance system, which is different from the US mandatory one and has a distinctive regulatory and institutional business environment characterized by efficient monitoring and high shareholder protection (Poutziouris *et al.*, 2015).

The increase in audit fees during the crisis period indicates that an economic slump can affect the relation between family control and audit fees. Nevertheless, it is hard to predict

the scenario of this effect owing to the intricate interaction of several factors. This study hypothesizes that the relation between family control and audit fees may change as macroeconomic conditions change. The results of the regression analysis suggest that during normal economic periods, family firms pay lower audit fees relative to non-family firms, while during crisis periods, family firms pay higher audit fees. Moreover, the results indicate that family firms affect audit fees through family involvement in ownership, management and board positions.

The remainder of the paper is organized as follows. Section 2 presents the literature review and the hypotheses to be tested in this study. The literature on audit fees in family firms and that on audit fees during financial crises are incorporated. After this, both streams of research are integrated and the research hypotheses are developed. Section 3 presents the data and methodology used to conduct the analysis. Section 4 presents the empirical findings along with the discussion. Section 5 concludes the paper.

2. Literature review and hypothesis development

In this section, the literature on audit fees in family firms and on audit fees during and following a financial crisis is reviewed. Following that, the two streams of research are integrated to derive testable hypotheses related to audit fees in family firms and the financial crisis.

2.1 Audit fees in family firms

Despite the importance and worldwide presence of family firms, research on the audit function in family firms is still limited, as prior studies have mainly focused on widely-held firms (Trotman and Trotman, 2010). Examining family firms is essential because of their prevalence and unique ownership structure, which results in different agency problems compared to non-family firms. Compared to their non-family counterparts, family firms experience less principal-agent agency costs and higher principal-principal agency costs. These features of family firms are likely to affect audit work and risk premium, as auditing is an agency cost incurred by shareholders in an attempt to decrease information asymmetry (Jensen and Meckling, 1976).

Prior research suggests that audit pricing in family firms is a function of both the demand for audit services by the family firms, as well as the supply of assurance services by the audit firm. The alignment of interest in family firms suggests a lower demand for and supply of audit services because of the alignment of interest and the presence of family members on the top management team. Demand-side theorists propose that demand for high-quality audit services is a function of information asymmetry and interest conflicts between investors and managers (Healy and Palepu, 2001). Founding families' active monitoring may reduce information asymmetry between managers and owners (Chen *et al.*, 2008) and decrease the inherent risk of material misstatement, thus leading to lower demand for audit efforts, and consequently, lower audit fees. From a supply-side perspective, auditor's engagement efforts are determined by the assessed client risks (Simunic, 1980). Bedard and Johnstone (2004) find evidence supporting this argument and suggesting that auditor's efforts and fees increase in the presence of weak corporate governance and high earnings manipulation risk. The close monitoring of family owners to their firms may result in a lower risk of material misstatement and, therefore, lower audit efforts and lower audit fees.

The entrenchment effect suggests lower/higher demand and higher supply of assurance services in family firms. Family firms are likely to demand lower assurance services to hide the consumption of private benefits, earnings management and manipulation. In contrast,

they may demand higher assurance services to signal the transparency of their financial statements, as well as enhancing the image and credibility of the family toward investors and creditors. Auditors, however, are likely to supply higher levels of audit services to detect earnings manipulation and consumption of private benefits at the expense of minority shareholders.

Some studies have documented differences in audit fees between family firms and their non-family counterparts (Fan and Wong, 2005; Khan and Subramaniam, 2012; Ho and Kang, 2013; Ben Ali and Lesage, 2014). However, these studies reported mixed evidence concerning the relationship between family control and audit fees. For instance, Fan and Wong (2005) and Khan and Subramaniam (2012) find evidence consistent with the entrenchment perspective suggesting that auditors supply higher levels of audit services to accounting for family expropriation and poor monitoring of management. On the other hand, Ho and Kang (2013) and Ben Ali and Lesage (2014) find evidence consistent with the interest alignment perspective suggesting that in comparison with non-family firms, family firms pay lower audit fees because of lower demand for external auditing services and lower perceived audit risk by auditors.

Family members' involvement in the corporate board and management is another channel through which the family can influence audit fees. Anderson and Reeb (2003) argued that founding families usually control director and management posts, and are, therefore, in a unique position to influence and monitor their firms. This results in less Type I agency problems and less information asymmetry. Similarly, Ho and Kang (2013) showed that the active involvement of family members in management and their presence on the board could alleviate agency conflicts between managers and owners, leading to lower demand for highly qualified auditors. Moreover, family directors can better monitor managers as they are generally more knowledgeable about their business activities, and their long-term tenures provide them with the relevant market and firm-specific information (Bartholomeusz and Tanewski, 2006). Poutziouris *et al.* (2015) suggested that family involvement in management and the board promotes stewardship behaviors and effective governance, which warrants goal alignment and restricts managerial entrenchment. This, in turn, reduces the demand for external audit efforts to resolve agency conflicts and, subsequently, reduces audit fees. Based on the above discussion, this study argues that during normal economic conditions, family involvement in ownership, management and directorship enhances internal monitoring and substitutes external audit efforts, reducing overall audit fees.

2.2 Audit fees and the financial crisis

Generally, economic downturns signify one of the most considerable environmental threats to a business's viability and profitability (Pearce and Michael, 2006). During such periods, uncertainty and risk increase, resulting in decreased customer demand and investors' overreaction to bad economic news (Zhang and Huang, 2013). These, in turn, negatively affect the firm's profitability and market performance. Because of the augmented risks, external auditors put in additional audit effort and charge higher risk premiums to make up for higher risk during periods of economic uncertainty. To reduce audit risk and avoid potential audit failures, auditors would use more personnel, prepare more thorough working papers and examine a larger sample in comparable work. Simunic (1980) model suggests that there is a positive relationship between audit fees and client firm business risk. In addition, Bell *et al.* (2001) showed that audit hours increase as business risk increases. This indicates that auditors consider the level of business risk and bill additional audit hours accordingly. Moreover, as firm performance deteriorates during crisis periods, firm

stakeholders demand further assurance (Schwartz and Menon, 1985). As large audit companies provide better assurance than smaller ones (Schwartz and Menon, 1985; DeFond, 1992), failing firms are likely to switch to larger and higher quality auditors and, thus, pay premium audit fees.

On the other hand, an economic crisis may negatively affect audit fees because of increased competition among audit firms (Abdel-Kalik, 1990). Audit firms may reduce the price of their services to "deal with the temporary overcapacity of experienced labor" (Alexeyeva and Svanström, 2015, p. 306). Companies also, in their turn, are in a favorable position and would have strong incentives "to actively negotiate for a reduced audit price" (Alexeyeva and Svanström, 2015, p. 307).

Prior findings on the impact of economic downturns on audit fees are inconclusive. Some studies documented a positive relationship between financial crisis and audit fees in Australia (Xu *et al.*, 2011) and China (Zhang and Huang, 2013). Using data from Chinese public firms over the years 2007 and 2008, Zhang and Huang (2013) found that accounting companies charge higher auditing fees as firms' risk increased during the 2008 crisis. Similarly, looking at Swedish firms, Alexeyeva and Svanström (2015) found that during the 2008 crisis period, auditors charged greater audit fees relative to the pre-crisis period. Moreover, audit fees continued to increase during the post-crisis period, with auditors taking notice of firms' leverage and losses. Other earlier studies, however, suggest that an economic crisis may negatively affect audit fees. For instance, Maher *et al.* (1992) showed that audit fees significantly decreased as competition escalated during the economic crisis in the late 1970s and early 1980s. Intense competition led to aggressive audit fee negotiation and aggressive audit services tendering (Beattie and Fearnley, 1994). Maher *et al.* (1992) suggested that the economic crisis may have contributed to the decline in audit fees, as it enabled companies to bargain with auditors effectively. Furthermore, Krishnan and Zhang (2014) showed that US financial firms were capable of negotiating lower audit fees during the 2008 crisis.

2.3 Audit fees, family involvement in ownership and the financial crisis

Prior studies reported mixed evidence on the impact of each of the 2008 financial crisis and family control on audit fees (Khan and Subramaniam, 2012; Ho and Kang, 2013; Ben Ali and Lesage, 2014; Krishnan and Zhang, 2014; Alexeyeva and Svanström, 2015; Chen *et al.*, 2018). This might be, in part, because of the fact that these studies examined the latter relationships separately, irrespective of the interactive effect of ownership and macroeconomic conditions during the period of study. This paper argues that the association between family control, in terms of involvement in ownership, management and directorship and audit fees may be influenced by economic and financial shocks.

As a financial shock influence the level of audit fees, it may affect the relation between family control and audit fees. Moreover, the evaluation of family firms' effect on audit fees within this setting may be particularly interesting as prior research proposes that economic crises influence family firms and non-family firms differently (Lee, 2006). During crisis periods, governance issues within family firms could become magnified as risks to both the family and the business upsurge. Uncertainty and risk stemming from an economic crisis may induce a family to indorse its interests at the expense of other stakeholders' interests. As families are usually undiversified with their wealth being tied up in the firms they control, a liquidity shock could threaten the existence of the family's empire. Consequently, relative to widely held firms, family firms may tend to implement survival-oriented strategies that help secure the control benefits of the family at the expense of non-family shareholders (Lins *et al.*, 2013). Their large equity positions and a large fraction of voting

rights help them extract wealth from minority shareholders (expropriation effect). Khalil *et al.* (2008) argued that as conflicts between controlling family owners and minority shareholders in family businesses intensify, auditors would have to increase the scale of their audit work owing to increased audit and litigation risks. Therefore, auditors would charge family firms higher audit fees to cover additional audit costs. Moreover, family owners might have incentives to use highly qualified auditors to signal reliable financial reporting during turbulent periods to obtain better terms of contracting such as lower cost of capital and attract investors. As the family attempts to preserve its security and wealth in the firm during a crisis, additional audit efforts may be particularly essential to reduce information asymmetry and protect minority shareholders from expropriation. Hence, it is expected that during such periods, family ownership would result in an increase in audit fees. Based on the above discussion, the following hypothesis is formulated:

H1. There is a positive relationship between family involvement in ownership and audit fees during crisis periods.

2.4 Audit fees, family involvement in management and directorship and the financial crisis

While family directors may act as internal monitors, reducing agency costs and substituting external audit efforts, their conduct may change in periods of economic adversity as increased risk and uncertainty threaten their wealth. During crisis periods, active family involvement in management and directorship may amplify the risk of shareholder expropriation as family members occupying board positions have the power to extract private benefits and protect the family's wealth at the cost of minority shareholders (expropriation effect). Dalton *et al.* (2007) noted that there is a greater possibility for disruption when the family has large equity stakes in the firm and when family members occupy CEO and chairman positions. Agency costs arise as owners/managers make decisions that are ineffective or inefficient, thereby not maximizing shareholders' returns. Studying the performance of Portuguese firms during the 2008 crisis, Vieira (2014) contended that the negative effect of turbulent economic conditions on investment and firm performance may be stronger for family firms relative to non-family firms because of higher debt levels, unqualified family management and the feeling of obligation family members feel to help another during a period of uncertainty, thus incurring greater costs and risk. Several agency theorists (Bebchuk *et al.*, 2000; Morck and Yeung, 2004) contend that agency problems in family-managed businesses arise as managers act exclusively for one single, engrained, dominant family stockholder and ignore other stockholders' interests. This allows controlling family members to actively participate in strategic management, nurturing a nepotistic culture that leads to favoritism of family interests and extraction of private benefits at the expense of non-family stockholders (Morck and Yeung, 2004). This nepotistic culture, therefore, makes it hard to resolve agency conflicts and to limit unproductive conduct (Schulze *et al.*, 2003). Moreover, when family members dominate board positions, they can exert significant influence on the selection of other board members and impair the monitoring of board effectiveness (Hope *et al.*, 2012). Jaggi and Leung (2007) showed that the audit committee's effectiveness is considerably reduced when family members occupy board seats. Hence, because of the more serious Type II agency conflicts and the weakened role of the audit committee, additional audit efforts would be needed to protect the interests of minority shareholders and reduce audit risk. Based on the above discussion, the following hypothesis is formulated:

H2. There is a positive relationship between family involvement in management and directorship and audit fees during crisis periods.

3. Data and methodology

3.1 Sample selection

The sample consists of FTSE 350 firms listed on the London Stock of Exchange from 2005 through 2013. The data are collected after the year 2005, where the UK adopted the international reporting financial standards, to build a homogeneous sample and isolate the impact of family control on audit fees. Moreover, the sample is limited to the year 2013 for the purpose of building a representative sample for the pre-crisis and post-crisis periods and because family and governance data are collected manually. Financial data (including audit service fees) are obtained from the Datastream database. Family ownership and corporate governance data are manually collected from annual reports. Firms in the financial, insurance and utility industries (ICB 7000 and 8000) are excluded because their assets are relatively large, and they require fewer audit efforts than firms with extensive inventory and receivables (Hay *et al.*, 2006). Moreover, these industries have different regulatory environment than their counterparts (Zaman *et al.*, 2011). Firm-year observations with missing financial and corporate governance data are also eliminated. The final sample consists of 1,346 firm-year observations. Table I presents the sample selection procedures and the distribution of sample firms by industry and year in Panels A and B, respectively. The industrials and consumer services industries constitute the majority of firms, with about 59 per cent of the total sample.

Panel A: sample selection procedures

	2005	2006	2007	2008	2009	2010	2011	2012	2013	Total sample
Total firms in FTSE 350 at year end	352	352	353	358	355	356	356	354	354	3,190
Companies in the financial and insurance industries (ICB 8000)	−101	−108	−104	−113	−112	−116	−113	−116	−116	−999
Companies in the utilities industry (ICB 7000)	−13	−12	−11	−10	−9	−9	−8	−7	−7	−86
Companies with missing corporate governance and financial values	−127	−98	−96	−92	−81	−75	−66	−64	−60	−759
Total sample	111	134	142	143	153	156	169	167	171	1,346

Panel B: distribution of sample firms by industry and year

ICB code	Industry	2005	2006	2007	2008	2009	2010	2011	2012	2013	Total sample
0001	Oil and gas	6	7	9	11	12	10	12	10	11	88
1000	Basic materials	9	10	10	14	15	15	24	22	19	138
2000	Industrials	42	53	54	51	52	51	54	53	53	463
3000	Consumer goods	15	20	19	19	21	22	22	22	24	184
4000	Health care	5	5	5	5	7	6	6	7	8	54
5000	Consumer services	28	33	37	35	38	44	40	39	42	336
6000	Telecommunications	3	3	3	3	3	2	4	6	7	34
9000	Technology	3	3	5	5	5	6	7	8	7	49
Total sample		111	134	142	143	153	156	169	167	171	1,346

Table I.
Sample description

3.2 Variable measurement and model specification

3.2.1 Independent variables. Family firms are defined using family board representation, family management or fractional family ownership (Poutziouris *et al.*, 2015; Al-Okaily and Naueihed, 2019). Specifically, a dummy variable (*FAMILYFIRM*) is used with a value of one when family members hold CEO position, occupy board seats or hold at least 10 per cent of the firm's equity. The annual report for each firm-year is used to identify whether founding families or their descendants are CEOs, directors or block-holders.

3.2.2 Control variables. Given that corporate governance has an impact on the demand for an external audit, and subsequently, the amount of audit fees to be paid (Zaman *et al.*, 2011), some governance variables related to the audit committee and the board of directors are included. The diligence of the audit committee and the board is measured by the number of meetings held in a given year (Menon and Williams, 1994; Okaily *et al.*, 2019). The size of the board and the audit committee are measured as the number of board and committee members, respectively. Board independence is measured by the percentage of non-executive directors on the board. The financial expertise of the audit committee is measured by the percentage of committee members with relevant financial experience on the audit committee.

Consistent with prior studies on audit fees, several firm-specific control variables are also included to account for profitability, size, complexity, the form of ownership, leverage, inherent risk and industry (Clatworthy and Peel, 2007; Zaman *et al.*, 2011). *BLOCK* represents the equity holdings of institutional shareholders with at least a 5 per cent equity stake. Loss in either or both of the previous two years is used as a surrogate for profitability. Receivables over total assets and inventories over total assets are included to control for the inherent risk. Leverage is measured as total long-term debt divided by total assets. The natural logarithm of total assets is used as a proxy for firm size. Assets turnover is used to control the complexity of firms. Firm age is also expected to affect audit fees because young firms suffer from less developed internal control systems and are exposed to a higher probability of failure (Basioudis, 2007). *AUDROT* is an auditor attribute that represents the number of years after which the company rotates its statutory auditor. Foreign sales over total assets are added to account for the complexity of the business (Hay *et al.*, 2006). Finally, the industry is included as the difficulty of the audit would differ from one industry to another (Simunic, 1980; Hay *et al.*, 2006)[1].

3.2.3 Model specification. To examine whether family ownership and involvement in management and directorship are associated with audit fees during crisis periods, the following regression is estimated:

$$\begin{aligned} \text{LNAF} = {} & \beta_0 + \beta_1 FAMILY + \beta_2 CRISIS + \beta_3 FAMILY{*}CRISIS + \beta_4 ACMEER \\ & + \beta_5 ACSIZE + \beta_6 ACEXP + \beta_7 NEDS + \beta_8 BODMEET + \beta_9 BODSIZE \\ & + \beta_{10} BLOCK + \beta_{11} LOSS + \beta_{12} RECTA + \beta_{13} LEV + \beta_{14} SIZE \\ & + \beta_{15} ATO + \beta_{16} FIRMAGE + + \beta_{17} INVTA + \beta_{18} AUDROT \\ & + \beta_{19} FORSALES + \beta_{20\text{–}27} INDY + \beta_{05\text{–}13} T + \varepsilon \end{aligned} \quad (1)$$

All variables are defined in the Appendix.

4. Empirical findings

4.1 Descriptive statistics

The descriptive statistics for the entire sample and the sub-samples of family versus non-family firms are presented in Table II. The results show that family firms account for 23 per cent of the studied sample, 306 out of 1,346 firms. The average audit fees are £2.93m and significantly differs between the family and non-family sub-samples (£1.40m vs £3.37m) (at the 1 per cent level). The governance structure in the sample reveals that the average audit committee contains four directors and meets four times a year. This is in compliance with the combined code where audit committees are recommended to be composed of at least three members and to meet at least three times a year. On average, 33 per cent of audit committee directors have relevant financial expertise. The size of the audit committee and the number of meetings significantly differ between the family and non-family sub-samples.

The average board comprises nine directors, of which 66 per cent are non-executive. On average, the board meets nine times a year. The percentage of non-executive directors on the board and the number of meetings differ significantly between the family and non-family firms' sub-samples. Comparatively, the size of the audit committee and the board, and the percentage of non-executive directors on the board are consistent with those reported in similar studies in the USA (Srinidhi *et al.*, 2014), notwithstanding the difference in governance regimes[2]. This implies that large companies in the UK tend to meet and sometimes exceed the minimum regulatory governance requirements, even if they are not mandated.

As for blockholders, institutional blockholdings are significantly higher in family firms relative to non-family firms (32 vs 22 per cent).

Table III displays the Pearson correlation matrix. The table shows a negative and significant association between *FAMILYFIRM* and *LNAF*, indicating that family firms pay fewer audit fees relative to non-family firms. Audit fees are found to be positively correlated with audit committee meetings and size, non-executive directors on the board and board size. These findings are consistent with the agency theory, which suggests that stronger governance mechanisms demand higher quality audits resulting in greater audit efforts, and consequently, higher fees (Zaman *et al.*, 2011). The table shows that the correlation coefficients among independent variables are generally low and do not indicate multicollinearity problems[3].

4.2 Multivariate analyzes

Following Anderson and Reeb (2003), Zaman *et al.* (2011) and Srinidhi *et al.* (2014), a two-way fixed effect model is used to examine the impact of family control on audit fees in crisis and non-crisis periods[4]. The fixed effects include dummy variables for each year and each industry code in the sample. Table IV presents the results from the stepwise regression of the natural log of audit fees (*LNAF*) on family firm status (*FAMILYFIRM*) and ownership (*FOWN*), governance variables (board and audit committee characteristics) and firm characteristics variables. Model 1 includes only control variables (industry and year dummy variables are not presented), Model 2 includes family firm status and crisis and Model 3 adds the interaction terms of family firm status and crisis. Models 4 and 5 are the same as Models 2 and 3, respectively, except that family ownership is tested instead of family firm status. All models reveal consistent results for the control variables[5]. The results from Models 2 and 3 indicate that *LNAF* has a significant negative relationship with *FAMILYFIRM* at the 1 per cent level. This finding suggests that family firms incur lower audit fees than non-family firms. However, Model 3 shows a significant positive association between the interaction term *FAMILY*CRISIS* ($t = 2.71$, $p = 0.01$) and *LNAF* implying that

Table II.
Descriptive statistics

	Full sample (n = 1,346)					Non-family firms (n = 1,040)					Family firms (n = 306)					
Variable	Mean	SD	Minimum	Median	Maximum	Mean	SD	Minimum	Median	Maximum	Mean	SD	Minimum	Median	Maximum	Differences in mean
AF (in mil)	2.93	8.93	0.02	0.88	221.00	3.37	10.00	0.02	1.00	221.00	1.40	2.62	0.04	0.63	16.70	1.97***
LNAF	13.81	1.35	9.88	13.69	19.21	13.95	1.35	9.88	13.82	19.21	13.33	1.23	10.69	13.35	16.63	0.62***
ACMEET	4.22	1.55	1.00	4.00	15.00	4.28	1.54	1.00	4.00	15.00	4.01	1.57	1.00	4.00	11.00	0.27***
ACSIZE	3.68	0.91	2.00	3.00	8.00	3.74	0.95	2.00	4.00	8.00	3.44	0.74	2.00	3.00	7.00	0.30***
ACEXP	0.33	0.28	0.00	0.33	6.00	0.33	0.29	0.00	0.33	6.00	0.33	0.24	0.00	0.33	1.00	0.01
NEDS	0.66	0.35	0.27	0.67	11.00	0.67	0.39	0.29	0.67	11.00	0.62	0.14	0.27	0.63	0.90	0.05***
BODMEET	8.64	2.92	1.00	8.00	33.00	8.92	2.89	2.00	9.00	33.00	7.68	2.81	1.00	7.00	24.00	1.24***
BODSIZE	9.28	2.39	5.00	9.00	20.00	9.27	2.30	5.00	9.00	20.00	9.30	2.70	5.00	9.00	20.00	−0.03
BLOCK	0.24	0.18	0.00	0.21	0.98	0.22	0.16	0.00	0.19	0.98	0.32	0.22	0.00	0.30	0.92	−0.10***
LOSS	0.13	0.34	0.00	0.00	1.00	0.13	0.34	0.00	0.00	1.00	0.13	0.33	0.00	0.00	1.00	0.01
RECTA	0.15	0.11	0.00	0.13	0.73	0.15	0.11	0.00	0.14	0.73	0.13	0.12	0.00	0.10	0.64	0.02***
LEV	0.19	0.15	0.00	0.17	0.77	0.20	0.15	0.00	0.18	0.77	0.14	0.15	0.00	0.11	0.60	0.05***
TOTALASSETS (in mil)	8.37	25.30	0.03	1.62	263.00	9.60	28.00	0.08	1.81	263.00	4.17	11.90	0.03	1.06	116.00	5.43***
SIZE	14.46	1.53	10.33	14.30	19.39	14.58	1.54	11.37	14.41	19.39	14.07	1.41	10.33	13.87	18.57	0.51***
ATO	1.03	0.62	0.00	0.92	4.25	1.06	0.61	0.00	0.94	3.83	0.92	0.66	0.00	0.80	4.25	0.14***
FIRMAGE	3.91	0.94	0.00	4.00	5.73	4.02	0.94	0.00	4.26	5.73	3.50	0.85	0.69	3.43	5.07	0.52***
INVTA	0.12	0.17	0.00	0.07	0.97	0.12	0.17	0.00	0.08	0.97	0.11	0.17	0.00	0.05	0.96	0.01
AUDROT	5.47	3.00	1.00	5.00	12.00	5.54	3.00	1.00	5.00	12.00	5.25	2.98	1.00	5.00	12.00	0.29
FORSALES	0.51	0.56	0.00	0.42	8.60	0.56	0.59	0.00	0.49	8.60	0.36	0.38	0.00	0.28	2.36	0.20***

Notes: ***Represent significance at 0.01 level. All variables are defined in the Appendix

Table III. Pearson correlation coefficients among variables

Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)
LNAF (1)	1																		
FAMILYFIRM (2)	−0.19*	1																	
ACMEET (3)	0.41*	−0.07*	1																
ACSIZE (4)	0.32*	−0.14*	0.18*	1															
ACEXP (5)	0.03	−0.01	0.04	−0.18*	1														
NEDs (6)	0.17*	−0.06*	0.12*	0.10*	0.03	1													
BODMEET (7)	−0.04	−0.18*	0.22*	−0.02	−0.01	−0.01	1												
BODSIZE (8)	0.51*	0.01	0.34*	0.40*	−0.04	0.07*	−0.06*	1											
BLOCK (9)	−0.19*	0.24*	−0.07*	−0.16*	0.06*	0.04	−0.06*	−0.11*	1										
LOSS (10)	−0.02	−0.01	−0.01	−0.04	−0.01	0.03	0.06*	−0.02	0.09*	1									
RECTA (11)	0.03	−0.09*	0.03	−0.02	−0.11*	−0.08*	0.10*	−0.07*	−0.07*	−0.04	1								
LEV (12)	0.10*	−0.14*	−0.02	0.11*	−0.01	0.01	0.03	0.05	−0.04	0.02	−0.15*	1							
SIZE (13)	0.75*	−0.14*	0.37*	0.33*	0.07*	0.18*	−0.02	0.57*	−0.22*	−0.01	−0.25*	0.19*	1						
ATO (14)	−0.13*	−0.09*	−0.04	−0.01	−0.12*	−0.02	0.10*	−0.17*	−0.05	−0.01	0.53*	−0.14*	−0.24*	1					
CRISIS (15)	0.04	−0.01	−0.02	−0.01	0.05	−0.03	0.06*	0.02	0.08*	−0.05	−0.00	0.08*	0.00	−0.03	1				
FIRMAGE (16)	0.08*	−0.23*	−0.06*	0.06*	−0.02	−0.01	0.12*	−0.03	−0.09*	−0.05*	0.04	0.06*	0.04	0.12*	−0.01	1			
INVTA (17)	−0.23*	−0.03	−0.09*	−0.05*	0.06*	−0.02	−0.02	−0.14*	−0.06*	0.02	−0.14*	−0.19*	−0.03	0.03	−0.02	0.15*	1		
AUDROT (18)	0.11*	−0.04	0.00	0.11*	−0.01	0.05*	−0.03	0.10*	−0.08*	−0.04	−0.08*	0.11*	0.15*	−0.02	0.14*	0.18*	0.03	1	
FORSALES (19)	0.30*	−0.15*	0.13*	0.08*	0.03	0.07*	−0.07*	0.07*	−0.11*	−0.07*	0.29*	−0.15*	0.01	0.22*	−0.00	0.10*	−0.07*	−0.02	1

Notes: *Represents significance at 0.05 level or below, all variables are defined in the Appendix

Table IV.
The interaction effect of family ownership and crisis on audit fees

Variable	Model 1	Model 2	Model 3	Model 4	Model 5
CONSTANT	3.653*** (12.62)	3.796*** (12.93)	3.805*** (12.99)	3.682*** (12.59)	3.687*** (12.63)
FAMILYFIRM		−0.155*** (−2.97)	−0.216*** (−3.81)		
CRISIS		0.113* (1.83)	0.050 (0.57)	0.107* (1.76)	0.075 (0.87)
*FAMILY*CRISIS*			0.303*** (2.71)		
FOWN				−0.190 (−1.21)	−0.368** (−2.10)
*FOWN*CRISIS*					0.861** (2.35)
ACMEET	0.082*** (5.59)	0.081*** (5.53)	0.082*** (5.59)	0.082*** (5.57)	0.081*** (5.54)
ACSIZE	0.050** (2.06)	0.045** (1.96)	0.047** (1.98)	0.049** (2.01)	0.049** (2.01)
ACEXP	−0.017 (−0.24)	−0.025 (−0.34)	−0.021 (−0.28)	−0.019 (−0.26)	−0.017 (−0.23)
NEDS	0.060 (1.05)	0.051 (0.89)	0.051 (0.89)	0.056 (0.99)	0.058 (1.03)
BODMEET	−0.024*** (−3.39)	−0.027*** (−3.72)	−0.027*** (−3.71)	−0.025*** (−3.47)	−0.024*** (−3.41)
BODSIZE	0.014 (1.28)	0.017 (1.51)	0.017 (1.52)	0.014 (1.29)	0.014 (1.27)
BLOCK	−0.005 (−0.04)	0.043 (0.36)	0.018 (0.15)	−0.002 (−0.02)	−0.028 (−0.24)
LOSS	0.079 (1.38)	0.074 (1.29)	0.073 (1.27)	0.078 (1.36)	0.078 (1.35)
RECTA	1.292*** (4.86)	1.325*** (4.99)	1.318*** (4.98)	1.292*** (4.86)	1.287*** (4.85)
LEV	−0.176 (−1.24)	−0.214 (−1.50)	−0.190 (−1.34)	−0.194 (−1.36)	−0.183 (−1.29)
SIZE	0.621*** (34.49)	0.614*** (33.95)	0.613*** (33.98)	0.619*** (34.24)	0.619*** (34.31)
ATO	−0.104** (−2.51)	−0.109*** (−2.65)	−0.104** (−2.54)	−0.105** (−2.53)	−0.102** (−2.48)
FIRMAGE	0.109*** (4.90)	0.0976*** (4.35)	0.0972*** (4.35)	0.107*** (4.80)	0.105*** (4.73)
INVTA	−1.464*** (−10.39)	−1.473*** (−10.48)	−1.473*** (−10.51)	−1.467*** (−10.40)	−1.465*** (−10.41)
AUDROT	−0.002 (−0.23)	−0.001 (−0.22)	−0.002 (−0.28)	−0.001 (−0.21)	−0.001 (−0.19)
FORSALES	0.520*** (13.53)	0.506*** (13.12)	0.505*** (13.13)	0.518*** (13.48)	0.517*** (13.48)
Adjusted R^2	0.73	0.73	0.73	0.73	0.73
F-statistic (<0.001)	117.56	114.84	112.12	113.97	111.07
n	1,346	1,346	1,346	1,346	1,346

Notes: *, **and ***represent significance at 0.10, 0.05 and 0.01 levels, respectively. All variables are defined in the Appendix. T-statistics are between parentheses. Industry and year dummy variables are not shown in the table

family firms pay higher audit fees during financial crises. Using family ownership instead of family firm status, the results in Models 4 and 5 reveal no significant association between *FOWN* and *LNAF*. However, the interaction term *FOWN*CRISIS* in Model 5 is positive and significant at the 5 per cent level. This result supports the first hypothesis that family ownership is positively related to audit fees during the financial crisis.

To test the second hypothesis, the impact of family involvement in both management (*FAMILYCEO*) and directorship (*FAMILYDIR*) is examined on *LNAF*. The results are presented in Table V. These results show a negative and significant association between each of *FAMILYCEO* (Models 6 and 7) and *FAMILYDIR* (Models 8 and 9), on the one hand, and *LNAF* at the 1 per cent level. These findings suggest that firms whose family members serve as CEOs or sit on the board incur fewer audit fees than their non-family counterparts. However, the coefficients of these variables (*FAMILYCEO* and *FAMILYDIR*) become positive and significant at the 5 per cent level when they interact with the *CRISIS* variable. The results, thus, support the second hypothesis that the existence of family members on the board and in the CEO position is associated with higher audit fees during the financial crisis.

4.3 Additional tests

First, to reduce "the possibility that the results are driven by systematic differences in firm characteristics between family and nonfamily firms" (Srinidhi *et al.*, 2014, p. 2312), each of the 306 families firm-years is matched with a control sample of propensity-score-matched

Variable	Model 6	Model 7	Model 8	Model 9
CONSTANT	3.722*** (12.80)	3.726*** (12.83)	3.828*** (13.06)	3.835*** (13.10)
FAMILYCEO	−0.153** (−2.53)	−0.216*** (−3.21)		
*FAMILYCEO*CRISIS*		0.293** (2.14)		
FAMILYDIR			−1.030*** (−3.59)	−1.254*** (−4.00)
*FAMILYDIR*CRISIS*				1.180** (2.17)
CRISIS	0.112* (1.72)	0.0777 (0.90)	0.111* (1.81)	0.078 (0.90)
ACMEET	0.082*** (5.57)	0.082*** (5.59)	0.082*** (5.58)	0.082*** (5.59)
ACSIZE	0.049** (2.02)	0.045** (2.03)	0.044* (1.82)	0.045* (1.83)
ACEXP	−0.018 (−0.25)	−0.013 (−0.18)	−0.024 (−0.33)	−0.022 (−0.31)
NEDS	0.059 (1.04)	0.059 (1.04)	0.053 (0.94)	0.053 (0.93)
BODMEET	−0.025*** (−3.50)	−0.026*** (−3.58)	−0.026*** (−3.61)	−0.026*** (−3.62)
BODSIZE	0.014 (1.23)	0.014 (1.28)	0.013 (1.18)	0.014 (1.25)
BLOCK	0.004 (0.03)	−0.012 (−0.11)	0.021 (0.18)	0.006 (0.05)
LOSS	0.073 (1.26)	0.072 (1.25)	0.072 (1.25)	0.072 (1.25)
RECTA	1.312*** (4.94)	1.323*** (4.99)	1.314*** (4.96)	1.310*** (4.95)
LEV	−0.215 (−1.51)	−0.201 (−1.41)	−0.217 (−1.53)	−0.199 (−1.40)
SIZE	0.619*** (34.45)	0.619*** (34.47)	0.614*** (34.12)	0.613*** (34.07)
ATO	−0.111*** (−2.69)	−0.110*** (−2.65)	−0.108*** (−2.62)	−0.104** (−2.53)
FIRMAGE	0.097*** (4.30)	0.097*** (4.32)	0.097*** (4.33)	0.097*** (4.34)
INVTA	−1.470*** (−10.45)	−1.473*** (−10.48)	−1.465*** (−10.44)	−1.462*** (−10.43)
AUDROT	−0.002 (−0.32)	−0.003 (−0.42)	−0.001 (−0.16)	−0.001 (−0.22)
FORSALES	0.510*** (13.22)	0.508*** (13.19)	0.511*** (13.32)	0.510*** (13.33)
Adjusted R^2	0.73	0.73	0.73	0.73
F-statistic (<0.001)	114.56	111.53	115.32	112.10
n	1,346	1,346	1,346	1,346

Notes: *, **and ***represent significance at 0.10, 0.05 and 0.01 levels, respectively. All variables are defined in the Appendix. T-statistics are between parentheses. Industry and year dummy variables are not shown in the table

Table V.
The interaction effect of family involvement and crisis on audit fees

non-family firm-year. The propensity score is estimated by applying the standard practice of using all relevant covariates (Brookhart *et al.*, 2006; Li and Prabhala, 2007; Semba and Kato, 2019) based on the following logit model:

$$\begin{aligned}\text{FAMILYFIRM} = {} & \beta_0 + \beta_1 FAMILY + \beta_2 CRISIS + + \beta_3 ACMEET + \beta_4 ACSIZE \\ & + \beta_5 ACEXP + \beta_6 NEDS + \beta_7 BODMEET + \beta_8 BODSIZE \\ & + \beta_9 BLOCK + \beta_{10} LOSS + \beta_{11} RECTA + \beta_{12} LEV + \beta_{13} SIZE \\ & + \beta_{14} ATO + \beta_{15} FIRMAGE + \beta_{16} INVTA + \beta_{17} AUDROT \\ & + \beta_{18} FORSALES + \beta_{19-26} INDY + \beta_{05-13} T + \varepsilon \end{aligned} \quad (2)$$

The family firm sample is matched with the non-family firm one using nearest-neighbor matching (caliper 0.03) [6]. This approach is preferable "because the closer the treated and untreated subjects are matched, the greater is the potential bias reduction" (Peel, 2018, p. 175).

Table VI provides univariate two-sample mean tests for family firms and matched non-family firms. The samples are well-balanced as all of the variables have no significant difference between the family firm group and non-family firm group, except for one variable. *BODSIZE*, which still differ between family firms and matched non-family firms is "included as the control variable in the second-stage regression to ensure that the lack of covariate balance does not influence [the paper's inferences]" (Mayew *et al.*, 2013; Du *et al.*, 2017, p. 126).

The results from the logistic regression used for estimating the propensity score are presented in Table VII. The correctly specified percentage is 80.68 per cent. The results

Variable	Family $n = 306$	Non-family $n = 306$	Difference	t-value for the mean difference
Propensity score	0.433	0.433	0.000	0.02
ACMEET	4.006	4.006	0.000	−0.00
ACSIZE	3.4412	3.3987	0.043	0.67
ACEXP	0.32723	0.33196	−0.005	−0.25
NEDS	0.61984	0.62386	−0.004	−0.37
BODMEET	7.6797	7.6863	−0.007	−0.03
BODSIZE	9.3039	8.8333	0.471	2.43**
BLOCK	0.32079	0.30149	0.019	1.15
LOSS	0.12745	0.09804	0.029	1.15
RECTA	0.13178	0.12526	0.007	0.74
LEV	0.14475	0.13685	0.008	0.68
SIZE	14.066	13.993	0.073	0.62
ATO	0.91827	1.0024	−0.084	−1.62
FIRMAGE	3.5014	3.4413	0.060	0.79
CRISIS	0.20915	0.20261	0.007	0.20
INVTA	0.10831	0.12382	−0.016	−1.05
AUDROT	5.2516	5.4837	−0.232	−0.94
FORSALES	0.35549	0.34235	0.013	0.45
LNAF	13.325	13.352	−0.027	−0.26

Table VI. Univariate differences in mean after family propensity score matching with the nearest neighbor

Notes: Propensity score estimated and matched using nearest neighbor matching. **significant at 0.05 level. All variables are defined in the Appendix

Dependent: *FAMILYFIRM*	Coefficient	*z*-value
CONSTANT	6.079***	5.76
CRISIS	−0.223	−0.69
ACMEET	0.0135	0.23
ACSIZE	−0.182*	−1.69
ACEXP	−0.215	−0.73
NEDS	−3.185***	−4.04
BODMEET	−0.133***	−4.12
BODSIZE	0.0487	1.13
BLOCK	2.142***	4.90
LOSS	−0.276	−1.16
RECTA	1.551*	1.67
LEV	−1.723***	−2.90
SIZE	−0.148**	−2.03
ATO	−0.157	−0.98
FIRMAGE	−0.486***	−5.48
INVTA	−0.751	−1.38
AUDROT	−0.00218	−0.08
FORSALES	−0.773***	−3.46
χ^2 (<0.001)	359.42	
% Correctly classified	80.68%	
n	1,346	

Notes: *, ** and ***represent significance at 0.10, 0.05 and 0.01 levels, respectively. All variables are defined in the Appendix. T-statistics are between parentheses. Industry and year dummy variables are not shown in the table

Table VII.
Logistic regression for estimating the propensity score

show that out of the 17 variables used in the model, 9 variables are significant: ACSIZE, *NEDS*, *BODMEET*, *BLOCK*, *RECTA*, *LEV*, *SIZE*, *FIRMAGE* and *FORSALES*. These findings indicate that in comparison with non-family firms, family firms are associated with smaller audit committees, less non-executive directors on the board, fewer board meetings, the higher percentage of blockholdings and receivables, less leverage and total assets and lower firm age and foreign sales. The results are consistent with the descriptive statistics in Table II and the Pearson correlation coefficients in Table III, and clearly justify the importance of controlling for the client firm characteristics.

The propensity score-matched regression results presented in Model 10 (Table VIII) are consistent with the expectations and show that *FAMILYFIRM* is negatively associated with *LNAF* at the 1 per cent level. However, this variable becomes positively associated with *LNAF* after interacting with the *CRISIS*. This finding suggests that family firms pay lower audit fees than non-family firms in non-crisis periods. However, these firms pay higher audit fees in crisis periods.

Second, following Evans and Schwartz (2014) and to analyze whether the unbalanced sample, where some firms do not have observations for the full-time period, may bias the results and lead to erroneous inferences, a weighted least squares (WLS) regression is used and used as an alternative testing method. In applying WLS to the sample, a probability sampling weight is constructed within each industry. This weight represents the demeaned value of:

> [. . .] the square root of the inverse of the count of the number of clients in each industry-year cell divided by the total number of observations for each industry across all years (Evans and Schwartz, 2014, p. 141).

Variable	PSM Model 10	WLS Model 11
CONSTANT	4.652*** (11.60)	3.746*** (13.06)
FAMILYFIRM	−0.189*** (−2.89)	−0.202*** (−3.69)
*FAMILYFIRM*CRISIS*	0.281** (1.98)	0.298*** (2.65)
CRISIS	0.0742 (0.45)	0.0153 (0.15)
ACMEET	0.128*** (5.41)	0.081*** (5.74)
ACSIZE	0.014** (2.32)	0.048** (2.03)
ACEXP	−0.270 (−1.14)	−0.020 (−0.29)
NEDS	0.121 (0.46)	0.048 (0.91)
BODMEET	−0.033*** (−2.69)	−0.025*** (−3.61)
BODSIZE	0.031** (2.04)	0.016 (1.50)
BLOCK	0.032(0.21)	0.037 (0.32)
LOSS	0.082 (0.92)	0.068 (1.21)
RECTA	0.568* (1.69)	1.281*** (5.06)
LEV	−0.273 (−1.14)	−0.153 (−1.10)
SIZE	0.573*** (21.17)	0.616*** (35.28)
ATO	−0.0280 (−0.48)	−0.104*** (−2.63)
FIRMAGE	0.0173	0.103*** (4.64)
INVTA	−1.206*** (−5.43)	−1.407*** (−10.39)
AUDROT	−0.014 (−1.35)	0.001 (0.10)
FORSALES	0.999*** (10.50)	0.514***(13.87)
Adjusted R^2	0.70	0.74
F-statistic (<0.001)	43.36	119.72
n	612	1,346

Table VIII. Additional tests on the effect of family ownership and involvement on audit fees

Notes: *, ** and ***represent significance at 0.10, 0.05 and 0.01 levels, respectively. All variables are defined in the Appendix. T-statistics are between parentheses. Industry and year dummy variables are not shown in the table

The results presented in Model 11 (Table VIII) are qualitatively similar to the main ones presented in Table IV.

5. Conclusion

Although the literature on audit fees and financial crisis is well-developed, it falls short from investigating the implication of the crisis on audit pricing in family firms. This research contributes to the literature by examining the effect of family involvement in ownership, management and directorship on audit fees during the crisis and non-crisis periods. Using a sample of UK listed firms during the period 2005-2013, this study finds that in normal economic conditions, family firms incur lower audit fees than their non-family counterparts. This result is consistent with that of Ho and Kang (2013) and Khan *et al.* (2015) and is driven by family firms' lower audit risk, and consequently, lower demand for external auditing. However, family firms incur higher audit fees during the financial crisis because of heightened audit risk and higher demand for higher audit quality to reduce Type II agency costs and protect minority shareholders from expropriation. Moreover, the study finds that family involvement through occupying board or CEO positions are associated with lower audit fees in normal economic conditions and higher fees in crisis periods. Although this finding is also consistent with Ho and Kang (2013), who find that firms in which family members occupy board or CEO positions are hesitant to appoint Big N auditors, and

therefore, pay lower audit fees, it suggests that this relationship does not hold in crisis periods where such firms pay higher audit fees.

The results of this study have both practical and policy implications for the demand and supply of audit services to firms having different ownership structures. First, this study sheds light on how different agency problems (Types I and II) would lead to different pricing of audit fees between family and non-family firms in crisis and non-crisis periods. This is important because it helps us understand the behavior of independent auditors in auditing family and non-family firms, as well as the determination of demand and supply of audit services in these firms. The findings also provide insights on how the family firm's value and view external auditing based on different economic conditions and different agency problems.

Finally, given that the period between 2008 and 2010 witnessed significant increase in audit fees paid by firms to their Big Four auditors who issued unqualified audit reports to firms just within a short period before they collapsed (Sikka, 2009), future research would consider the value of audit and non-audit fees paid by family vs non-family firms to their auditors and their impact on auditor independence.

Notes

1. The Big Four is not added as a control variable because all firms in the sample are audited by one of the Big Four.
2. Unlike the US mandatory corporate governance system, the UK follows the "comply or explain" corporate governance approach.
3. The highest coefficient is 57 per cent between board size and firm size. The VIF values of the independent variables are further analyzed and the highest value is fairly below the cut-off value of 10.
4. Specifically, this paper is comparable to Zaman *et al.* (2011), who examined the impact of corporate governance on audit fees using a similar FTSE 350 sample but for a different time period. The results using two-way fixed effect are also robust to the use of firm-fixed effect and standard errors clustered by firm.
5. Unlike most of the relevant studies in the USA where a positive association between *INVTA* and audit fees was found, *INVTA* has a negative coefficient significant at the 1 per cent level. This finding is consistent with those found in a relevant UK study (Reid *et al.*, 2019) and most other relevant Chinese studies (Wu *et al.*, 2018). The negative association could be attributed to auditors "charging a significant discount on the opening balance of inventory" (Wu *et al.*, 2018, p. 351). This finding warrants further investigation in the UK context.
6. The propensity score estimation results are robust to the use of nearest neighbor matching with calipers 0.01 and 0.05, the use of kernel-based matching as an alternative matching approach and the following logistic estimation model for family control used by Srinidhi *et al.* (2014):

$$FAMILYFIRM = \beta 0 + \beta 1LEV + \beta 2ROA + \beta 3SIZE + \text{Industry effects} + \text{e}.$$

References

Abdel-Kalik, A.R. (1990), "The jointness of audit fees and demand for MAS: a self-selection analysis", *Contemporary Accounting Research*, Vol. 6 No. 2, pp. 295-322.

Alexeyeva, I. and Svanström, T. (2015), "The impact of the global financial crisis on audit and non-audit fees: evidence from Sweden", *Managerial Auditing Journal*, Vol. 30 Nos 4/5, pp. 302-323.

Al-Okaily, J. and Naueihed, S. (2019), "Audit committee effectiveness and family firms: impact on performance", *Management Decision*, available at: https://doi.org/10.1108/MD-04-2018-0422

Anderson, R.C. and Reeb, D.M. (2003), "Founding-family ownership and firm performance: evidence from the S&P 500", *The Journal of Finance*, Vol. 58 No. 3, pp. 1301-1328.

Bartholomeusz, S. and Tanewski, G.A. (2006), "The relationship between family firms and corporate governance", *Journal of Small Business Management*, Vol. 44 No. 2, pp. 245-267.

Basioudis, I.G. (2007), "Auditor's engagement risk and audit fees: the role of audit firm alumni", *Journal of Business Finance and Accounting*, Vol. 34 Nos 9/10, pp. 1393-1422.

Beattie, V. and Fearnley, S. (1994), "The changing structure of the market for audit services in the UK – a descriptive study", *The British Accounting Review*, Vol. 26 No. 4, pp. 301-322.

Bebchuk, L.A., Kraakman, R. and Triantis, G. (2000), "Stock pyramids, cross-ownership, and dual class equity: the mechanisms and agency costs of separating control from cash-flow rights", *Concentrated Corporate Ownership*, University of Chicago Press, Chicago, IL, pp. 295-318.

Bedard, J.C. and Johnstone, K.M. (2004), "Earnings manipulation risk, corporate governance risk, and auditors' planning and pricing decisions", *The Accounting Review*, Vol. 79 No. 2, pp. 277-304.

Bell, T.B., Landsman, W.R. and Shackelford, D.A. (2001), "Auditors' perceived business risk and audit fees: analysis and evidence", *Journal of Accounting Research*, Vol. 39 No. 1, pp. 35-43.

Ben Ali, C. and Lesage, C. (2014), "Auditor choice, audit fees and principal principal conflict", Working Papers 2014, Department of Research, Ipag Business School.

Brookhart, M.A., Schneeweiss, S., Rothman, K.J., Glynn, R.J., Avorn, J. and Stürmer, T. (2006), "Variable selection for propensity score models", *American Journal of Epidemiology*, Vol. 163 No. 12, pp. 1149-1156.

Chen, S., Chen, X. and Cheng, Q. (2008), "Do family firms provide more or less voluntary disclosure?", *Journal of Accounting Research*, Vol. 46 No. 3, pp. 499-536.

Chen, L., Krishnan, G.V. and Yu, W. (2018), "The relation between audit fee cuts during the global financial crisis and earnings quality and audit quality", *Advances in Accounting*, Vol. 43, pp. 14-31.

Clatworthy, M.A. and Peel, M.J. (2007), "The effect of corporate status on external audit fees: Evidence from the UK", *Journal of Business Finance and Accounting*, Vol. 34 Nos 1/2, pp. 169-201.

Dalton, D.R., Hitt, M.A., Certo, S.T. and Dalton, C.M. (2007), "The fundamental agency problem and its mitigation: independence, equity, and the market for corporate control", *Academy of Management Annals*, Vol. 1 No. 1, pp. 1-64.

Defond, M.L. (1992), "The association between changes in client firm agency costs and auditor switching", *Auditing*, Vol. 11 No. 1, p. 16.

Du, L., Masli, A. and Meschke, F. (2017), "Credit default swaps on corporate debt and the pricing of audit services", *Auditing: A Journal of Practice and Theory*, Vol. 37 No. 3, pp. 117-144.

Evans, L., Jr and Schwartz, J. (2014), "The effect of concentration and regulation on audit fees: an application of panel data techniques", *Journal of Empirical Finance*, Vol. 27, pp. 130-144. .

Fan, J.P. and Wong, T.J. (2005), "Do external auditors perform a corporate governance role in emerging markets? Evidence from East Asia", *Journal of Accounting Research*, Vol. 43 No. 1, pp. 35-72.

Hay, D., Knechel, R. and Li, V. (2006), "Non-audit services and auditor independence: New Zealand evidence", *Journal of Business Finance and Accounting*, Vol. 33 Nos 4/6, pp. 715-734.

Healy, P.M. and Palepu, K.G. (2001), "Information asymmetry, corporate disclosure, and the Capital markets: a review of the empirical disclosure literature", *Journal of Accounting and Economics*, Vol. 31 Nos 1/3, pp. 405-440.

Ho, J.L. and Kang, F. (2013), "Auditor choice and audit fees in family firms: evidence from the S&P 1500", *Auditing: A Journal of Practice and Theory*, Vol. 32 No. 4, pp. 71-93.

Hope, O.K., Langli, J.C. and Thomas, W.B. (2012), "Agency conflicts and auditing in private firms", *Accounting, Organizations and Society*, Vol. 37 No. 7, pp. 500-517.

Jaggi, B. and Leung, S. (2007), "Impact of family dominance on monitoring of earnings management by audit committees: evidence from Hong Kong", *Journal of International Accounting, Auditing and Taxation*, Vol. 16 No. 1, pp. 27-50.

Jensen, M.C. and Meckling, W.H. (1976), "Theory of the firm: managerial behavior, agency costs and ownership structure", *Journal of Financial Economics*, Vol. 3 No. 4, pp. 305-360.

Khalil, S., Magnan, M.L. and Cohen, J.R. (2008), "Dual-class shares and audit pricing: evidence from the Canadian markets", *Auditing: A Journal of Practice and Theory*, Vol. 27 No. 2, pp. 199-216.

Khan, A. and Subramaniam, N. (2012), "Family firm, audit fee and auditor choice: Australian evidence", *Financial Markets and Corporate Governance Conference*.

Khan, A., Muttakin, M.B. and Siddiqui, J. (2015), "Audit fees, auditor choice and stakeholder influence: evidence from a family-firm dominated economy", *The British Accounting Review*, Vol. 47 No. 3, pp. 304-320.

Krishnan, G.V. and Zhang, Y. (2014), "Is there a relation between audit fee cuts during the global financial crisis and banks' financial reporting quality?", *Journal of Accounting and Public Policy*, Vol. 33 No. 3, pp. 279-300.

Lee, J. (2006), "Family firm performance: further evidence", *Family Business Review*, Vol. 19 No. 2, pp. 103-114.

Leung, S., Richardson, G. and Jaggi, B. (2014), "Corporate board and board committee independence, firm performance, and family ownership concentration: an analysis based on Hong Kong firms", *Journal of Contemporary Accounting and Economics*, Vol. 10 No. 1, pp. 16-31.

Li, K. and Prabhala, N.R. (2007), "Self-selection models in corporate finance", Chapter 2, *Handbook of Corporate Finance: Empirical Corporate Finance*, Handbooks in Finance Series, Elsevier, Amsterdam.

Lins, K.V., Volpin, P. and Wagner, H.F. (2013), "Does family control matter? International evidence from the 2008-2009 financial crisis", *Review of Financial Studies*, Vol. 26 No. 10, pp. 2583-2619.

Maher, M.W., Tiessen, P., Colson, R. and Broman, A.J. (1992), "Competition and audit fees", *Accounting Review*, pp. 199-211.

Mayew, W.J., Sharp, N.Y. and Venkatachalam, M. (2013), "Using earnings conference calls to identify analysts with superior private information", *Review of Accounting Studies*, Vol. 18 No. 2, pp. 386-413.

Menon, K. and Williams, J.D. (1994), "The use of audit committees for monitoring", *Journal of Accounting and Public Policy*, Vol. 13 No. 2, pp. 121-139.

Morck, R. and Yeung, B. (2004), "Family control and the rent-seeking society", *Entrepreneurship Theory and Practice*, Vol. 28 No. 4, pp. 391-409.

Okaily, J.A., Dixon, R. and Salama, A. (2019), "Corporate governance quality and premature revenue recognition: evidence from the UK", *International Journal of Managerial Finance*, Vol. 15 No. 1, pp. 79-99.

Pearce, J.A. and Michael, S.C. (2006), "Strategies to prevent economic recessions from causing business failure", *Business Horizons*, Vol. 49 No. 3, pp. 201-209.

Peel, M.J. (2018), "Addressing unobserved selection bias in accounting studies: the bias minimization method", *European Accounting Review*, Vol. 27 No. 1, pp. 173-183.

Poutziouris, P. (2011), "The financial structure and performance of owner-managed family firms: evidence from the UK economy/estructura financiera y rentabilidad en empresas familiares gestionadas por la propiedad: evidencias de la economía inglesa", *Universia Business Review*, p. 70.

Poutziouris, P., Savva, C.S. and Hadjielias, E. (2015), "Family involvement and firm performance: evidence from UK listed firms", *Journal of Family Business Strategy*, Vol. 6 No. 1, pp. 14-32.

Reid, L.C., Carcello, J.V., Li, C., Neal, T.L. and Francis, J.R. (2019), "Impact of auditor report changes on financial reporting quality and audit costs: evidence from the United Kingdom", *Contemporary Accounting Research*, Vol. 36 No. 3, pp. 1501-1539.

Schulze, W.S., Lubatkin, M.H. and Dino, R.N. (2003), "Toward a theory of agency and altruism in family firms", *Journal of Business Venturing*, Vol. 18 No. 4, pp. 473-490.

Schwartz, K.B. and Menon, K. (1985), "Auditor switches by failing firms", *Accounting Review*, pp. 248-261.

Semba, H.D. and Kato, R. (2019), "Does big N matter for audit quality? Evidence from Japan", *Asian Review of Accounting*, Vol. 27 No. 1, pp. 2-28.

Sikka, P. (2009), "Financial crisis and the silence of the auditors", *Accounting, Organizations and Society*, Vol. 34 Nos 6/7, pp. 868-873.

Simunic, D.A. (1980), "The pricing of audit services: theory and evidence", *Journal of Accounting Research*, Vol. 18 No. 1, pp. 161-190.

Srinidhi, B.N., He, S. and Firth, M. (2014), "The effect of governance on specialist auditor choice and audit fees in US family firms", *The Accounting Review*, Vol. 89 No. 6, pp. 2297-2329.

Trotman, A.J. and Trotman, K.T. (2010), "The intersection of the family business and audit research: Potential opportunities", *Family Business Review*, Vol. 23 No. 3, pp. 216-229.

Vieira, E.S. (2014), "Corporate risk in family businesses under economic crisis", *Innovar*, Vol. 24 No. 53, pp. 61-73.

Wu, X., Wang, X. and Yang, Y. (2018), "The puzzling association between inventory and auditor pricing in China", *China Journal of Accounting Research*, Vol. 11 No. 4, pp. 351-366.

Xu, Y., Jiang, A.L., Fargher, N. and Carson, E. (2011), "Audit reports in Australia during the global financial crisis", *Australian Accounting Review*, Vol. 21 No. 1, pp. 22-31.

Zaman, M., Hudaib, M. and Haniffa, R. (2011), "Corporate governance quality, audit fees and non-audit services fees", *Journal of Business Finance and Accounting*, Vol. 38 Nos 1/2, pp. 165-197.

Zhang, T. and Huang, J. (2013), "The risk premium of audit fee: evidence from the 2008 financial crisis", *China Journal of Accounting Studies*, Vol. 1 No. 1, pp. 47-61.

Appendix. Variable definition

AF	= Total audit fees paid by a firm.
LNAF	= Natural logarithm of total audit fees paid by a firm.
FAMILYFIRM	= Indicator variable with a value of one if a firm has family members who hold CEO position, occupy board seats or hold at least 10 per cent of the firm's equity, zero otherwise.
FOWN	= Per cent of equity owned by family members.
FAMILYCEO	= Dummy variable equal to one if the CEO is a family member.
FAMILYDIR	= Percentage of family members occupying positions on the board of directors.
CRISIS	= Indicator variable with a value of one for each of the years 2008 and 2009; zero otherwise.
FAMILYCRISIS	= Interaction variable of FAMILYFIRM and CRISIS.
ACMEET	= The number of audit committee meetings held during a year.
ACSIZE	= The total number of audit committee members.

ACEXP	= The percentage of audit committee directors with relevant financial expertise on the audit committee.
NEDS	= The proportion of non-executive directors on the board.
BODMEET	= Number of board meetings held in a given year.
BODSIZE	= Number of directors on the board.
BLOCK	= Percentage ownership of block-holders who hold at least 5 per cent or more of outstanding common shares and are unaffiliated with management.
LOSS	= Indicator variable with a value of one if a firm incurred losses in either one or both of the previous two years; zero otherwise.
RECTA	= Receivables divided by total assets.
LEV	= Total long-term debt to total assets.
SIZE	= Natural logarithm of total assets at year-end.
ATO	= Assets turnover.
FIRMAGE	= Natural logarithm of the number of years ever since the firm's foundation.
INVTA	= Inventory divided by total assets.
AUDROT	= The number of years after which the company rotates its statutory auditor.
FORSALES	= Foreign sales divided by total assets.
INDY	= Type of industry. Indicator variable of one for each of the following industry types: oil and gas, basic materials, industrials, consumer goods, health care, consumer services, telecommunications and technology.
T	= Time. Indicator variables of one for each of the years 2005-2013.

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