THE EFFECTS OF AUDIT FIRM AND PARTNER INDUSTRY SPECIALISATION AND CORPORATE GOVERNANCE ON AUDIT QUALITY AND EARNINGS QUALITY

KHAIRUL AYUNI BINTI MOHD KHARUDDIN

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Thesis Summary

This PhD thesis examines two empirical issues. Firstly, the study examines the effects of industry specialist auditors and corporate governance on audit quality. Secondly, the study investigates the effects of industry specialist auditors and corporate governance on earnings quality. These two empirical research questions are examined under three different level of analysis for auditor industry specialisation: 1) the firm national-city framework, 2) the partner national-city framework, and 3) the joint firm-partner national-city framework. The corporate governance characteristics examined in this thesis are female directorship, foreign directorship, internal audit function, and audit committee characteristics relating to size, independence, expertise and activity. Audit quality in this study, is measured by the variation in the level of audit effort, as reflected in audit fees. The earnings quality measures examined in this study are the client's level of discretionary accruals, accrual estimation error and likelihood of reporting a profit (or avoiding a loss). The study's sample includes initially all companies listed in the London Stock Exchange (LSE) between 2008 and 2011. The findings from the first empirical study suggest that the audit partner industry leadership at the national level drives the fee premium for auditor industry specialisation in the U.K., above and beyond the audit firm industry leadership. Nevertheless, the evidence that non-industry leading partners within the industry leading audit firms are still able to charge a fee premium indicates that some form of knowledge sharing and transfer of industry expertise do exists between the partners within the Big 4 audit firms. In addition, the results also suggests that foreign directors and active audit committee demand additional and extensive audit effort from their auditor in order to certify their monitoring function, resulting in the charging of higher audit fees. Next, the findings from the second empirical enquiry suggest that audit firm industry leadership plays a more important role than audit partner industry leadership in promoting higher earnings quality, as evidenced by lower discretionary accruals, lower accrual estimation error and lower likelihood of reporting a profit. In addition, the study also finds that the female directors, audit committee independence, and audit committee's accounting or financial expertise contribute to accruals manipulation. This finding is interesting given the data is tested in the period during and following on the 2007/2008 global financial crisis, suggesting that some corporate governance mechanisms may be less effective in constraining earnings management, but somehow the effect is moderated by the presence and the role of industry specialist auditors. Overall, the empirical findings on auditor industry specialisation seem to support the product differentiation theory, given the consistent evidence between fee premium and higher earnings quality offered by industry specialist auditors. The findings from the corporate governance analyses are consistent with the institutional theory and/or the managerial hegemony theory, as the role of board is viewed to be passive and more of ceremonial in nature during the sample period investigated. The thesis's findings are of potential interest to policy makers, practitioners and investors as the issues relating to audit quality, earnings quality and corporate governance are pertinent for investor protection in the financial market.

Keywords: auditor industry specialisation, corporate governance, United Kingdom, audit quality, earnings quality

DEDICATION

To my parents, even all words will not be enough to thank you.
I hope that I have made you proud.

To my beloved husband, this has been our journey, a remarkable and a memorable one.
Thank you for all your sacrifices and for being there with me all the way through.

To my dearest children, I hope this journey of ours has taught you how to battle difficulties with patience and perseverance. Nothing should stop you from pursuing your dreams. Remember that knowledge is power.

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LIST OF ABBREVIATIONS

FRC	Financial Reporting Council
ISA	International Standards on Auditing
GAAP	Generally Accepted Accounting Principles
CEO	Chief Executive Officer
IPO	Initial Public Offering
IIA	Institute of Internal Auditors
SOX	Sarbanes-Oxley Act
ERC	Earnings response coefficient
PCAOB	Public Company Accounting Oversight Board
IOS	Investment opportunity sets
LSE	London Stock Exchange
U.K.	United Kingdom
U.S.	United States of America
OLS	Ordinary least square
2SLS	Two-stage least squares
VIF	Variance inflation factor

CHAPTER 1
INTRODUCTION

1.1 Background of the study

A study on auditor industry specialisation, corporate governance, audit quality and earnings quality remains important to policy-makers, investors and regulators. This is because the quality of company reported earnings affects investors' confidence and allocation of resources in the financial markets. Company reported earnings are prone to management legitimate manipulations, and the functions of corporate governance and external auditing serve as direct monitoring mechanisms of the company's financial reporting processes. As these two functions also potentially have a direct impact on the degree of earnings management exercised by the companies' management, the importance of their role and effectiveness cannot be overemphasised.

The global financial crisis that started in 2007/2008 has focused a great deal of attention and scrutiny by investors, the media, governments and others, on various aspects of accounting, auditing, and financial reporting. The effectiveness of the corporate governance function, auditor and the regulatory framework has also become a global concern. This is because the recent 2007/2008 global financial crisis resulted in the downfall of many high profile companies, with many critics blaming the auditors and corporate governance for their failure to prevent such a crisis from happening.

Following the financial crisis, the Financial Reporting Council (FRC) in the U.K. introduced, in 2010 (with updates in 2012 and 2014), the new then Corporate Governance Code, the U.K. Stewardship Code and the Audit Firm Governance Code with the aim of improving the quality of governance and financial reporting in the public listed companies in the U.K., after taking into account lessons learned from the 2007/2008 financial crisis (FRC, 2010). Hence, corporate governance research using more recent data is important, considering the changing financial reporting landscape and regulatory environment which has impacted the role played by corporate boards and external auditors. Moreover, there has been no published study jointly examining the relationship between corporate governance, external audit and earnings management in the U.K., generally, and in the period during and subsequent to the financial crisis, specifically.

The PhD thesis supports the argument that a company's corporate governance function and the auditor's quality characteristics cannot be isolated from one another when analysing their effect on audit quality and earnings quality, as the auditor's monitoring role varies depending on the strength of the company's corporate governance structure (Larcker and Richardson, 2004). Consistently, empirical research provides support for the notion that characteristics of effective company corporate governance, such as the board of directors and the audit committee function, as well as the internal audit function, contribute to less earnings management activities[3]. In addition, findings from prior auditor choice studies suggest that the auditor's differentiation strategy (such as auditor's industry specialisation) is valued by the board of directors, audit committee and shareholders as signalling a higher quality audit, as they are more likely to choose industry specialist auditors instead of relying just on a blanket brand name (Abbott and Parker, 2000; Beasley and Petroni, 2001; Chen *et al*., 2005; Velury *et al*., 2003; Kane and Velury, 2004).

The PhD thesis examines the effects on audit pricing and earnings quality when the U.K. public listed companies are audited by industry specialist auditors. As audit quality is not easily observable, researchers typically examine the quality of reported earnings to ascertain the quality of audits (Francis, 2011). It is generally presumed that high audit quality translates into high quality of earnings (Velury, 2003). Hence, this PhD thesis fills the gap in the literature examining whether the U.K. audit fee premium differential signals high quality audit which, in turn, constrains earnings management practices in the U.K. public listed companies, given the existing corporate governance regulation, and whether it ultimately enhances earnings quality.

This effort is fruitful given the latest research development in the identified sources of auditor industry specialisation. Whether industry specialist auditors earn a fee premium has yet to be convincingly documented, as the existence of a specialisation premium appears to be conditional on the market examined and measures of industry specialisation used (Causholli *et al*., 2010; Habib, 2011). Until now, there has been no strict guideline in the profession on the definition of industry specialist auditor and the requirements that the audit firm need to fulfil in order to become one. While earlier research defines industry specialist auditor as the audit firm with the largest market share in a particular industry (Francis *et al*., 2005; Craswell *et al*., 1995; Balsam *et al*., 2003), more recent studies provide evidence that the industry specialist auditor phenomenon is more accurately reflected in the audit firm's city-specific industry leadership (Ferguson *et al*., 2003; Basioudis and Francis, 2007; Hay and Jeter, 2011). Whether the audit pricing is dominated by firm-level or office-level industry expertise might explain the strength of knowledge sharing and transfer of industry expertise between the city offices of the audit firms. So far, the results from this line of research are still inconclusive.

More recently, researchers have started focusing on the partner industry expertise, based on the argument that audit partners' depth of knowledge, experience and expertise dealing with clients within a specific industry is a somewhat unique "*private human capital*" to the partner and cannot be easily shared with other partners or staff residing within the same audit office or even the same audit firm (Chi and Chin, 2011). Thus, this would mean that audit quality is not only attributed to the brand name and industry leadership of the audit firm, but, instead, is also affected by the individual partner's

[3] Earnings management is estimated in the prior literature using various proxies such as discretionary accruals (Peasnell, 2000, 2005: Klein, 2002; Xie *et al*., 2003: Koh, 2003; Bédard *et al*., 2004; Larcker and Richardson, 2004; Yang and Krishnan, 2005), earnings restatements (Ferguson *et al*., 2004), income smoothing (Chung *et al*., 2002) and accounting conservatism (Ahmed and Duellman, 2007; Krishnan and Visvanathan, 2008), amongst others.

characteristics and reputation (Goodwin and Wu, 2014). Research in this area is still scarce. Whether audit quality is homogenous across an individual audit firm, at the city-specific offices and at the partner level is yet to be investigated in the U.K. This is an important research question given the findings by Basioudis and Francis (2007) that the Big Four industry specialisation premium for their national and office-level industry leadership in the U.K. is priced differently as compared to other developed markets such as the U.S. and Australia.

In respect of earnings quality, the PhD thesis employs a rigorous approach in measuring earnings quality using proxies such as discretionary accruals, accrual estimation error and likelihood of reporting a profit rather than a loss. This is because earnings quality is an elusive concept to tackle, and there is no single measure that can be claimed to be ultimately better than others and in all decision models (Vafeas, 2005; Dechow *et al*., 2010). This rigorous application of multi-techniques and methodologies applied in the thesis makes the research findings more robust in generating conclusive and confirmatory predictions of the relationships identified. While this section of the chapter set the scene, the next section explains the motivation of the study.

1.2 Motivation of the study

This study is motivated by several interrelated factors:

1) A review of the prior auditor industry specialisation literature reveals a paucity of research in the U.K. examining the audit partner industry expertise on financial reporting quality. Recent audit quality frameworks proposed by the U.K. Financial Reporting Council (2008) and Knechel *et al*. (2013) indicate that audit partner skills, knowledge, and expertise are important drivers of audit quality. However, there is a paucity of research with regards to the use of the individual audit partner as the unit of analysis. Furthermore, the disclosure of the name of the senior statutory auditor (or engagement partner) signing off the auditor's report for and on behalf of the audit firm was only made mandatory in the U.K. for financial years beginning on or after 6 April 2008 (Section 503 of Companies Act 2006). This study represents a response to the call from academics (DeFond and Francis, 2005; Carcello, 2005) and policy makers for more scrutiny and understanding of audit quality at the individual audit partner level. Besides this, whether the audit firm's industry expertise contributes to better financial reporting quality in the U.K. audit market has yet to be researched.

2) A review of the prior governance literature reveals a scarcity of research in relation to board diversity. The effect of female directorship, foreign directorship and internal audit function on various measures of audit quality and earnings quality have yet to be thoroughly investigated, particularly in the U.K. Although the issues might have been examined in different countries, those findings may not apply in the U.K., given the different size of the capital markets, the

cultural differences, the unique regulatory and economic environments, as well as the effectiveness of the governance mechanisms and investor protection.

3) This prior review also reveals a scarcity of research relating to the role of the industry specialist auditor using the national-city framework in constraining earnings management practice in the U.K. Also, the partner national-city framework and the joint firm-partner national-city framework are identified as areas that require attention and empirical analysis in the U.K. There is, therefore, a strong incentive to investigate, empirically, the effect of those attributes on earnings management.

4) Prior research on financial crises (e.g. the Asian crisis and the 2007/2008 financial crisis) has shown that the motivation for earnings management is higher during the financial crisis period due to the unstable economic and financial conditions (e.g. Charoenwong and Jiraporn, 2008; Lang and Maffett, 2011; Habib *et al*., 2013). Consequently, various governance reforms have taken place following the 2007/2008 financial crisis (for example, the implementation of the U.K. Corporate Governance Code, U.K. Stewardship Code and the Audit Firm Governance Code in 2010) with the aim to improve the quality of governance and audit in the public listed companies, given that directors and auditors have been heavily criticised and blamed for lack of necessary diligence, contributing to the crisis. Therefore, the financial crisis setting makes it interesting to analyse the effect of the industry specialist auditor and corporate governance on audit quality and earnings quality to see whether the findings would turn out differently as compared to prior studies carried out during non-crisis periods. Also, corporate governance research using more recent data is important, considering the changing financial reporting landscape and regulatory environment in the U.K. which has recently impacted the role played by corporate boards and external auditors.

1.3 Objectives of the study

The objectives of the PhD thesis are two-fold:

1) To examine the effect of industry specialist auditors and corporate governance on audit quality. The audit quality in this study is measured by the variation in the level of audit effort as reflected in audit fees.

2) To examine the effectiveness of industry specialist auditors and corporate governance in promoting earnings quality. Earnings quality in this study is measured using three different proxies – discretionary accruals (both in magnitude and direction), accrual quality (based on the level of accrual estimation error), and company likelihood of reporting a profit rather than a loss.

The study covers the period from 2008 to 2011, which is the period affected by the financial crisis.

1.4 Contribution of the study

This study contributes to the extant literature in several ways:

1) The PhD thesis examines various sources of auditor industry specialisation in relation to audit pricing and earnings quality in the U.K. context.

- The study examines Big 4 auditor industry specialisation in the U.K. under three different national-city frameworks:
  - (i) The *firm* national-city framework
  - (ii) The *partner* national-city framework
  - (iii) The *joint firm-partner* national-city framework

- While the firm national-city framework analysis in this study represents an extension of prior research work using the same approach (e.g. Basioudis and Francis, 2007; Reichelt and Wang, 2010; Hay and Jeter, 2011), this study contributes to the auditor industry specialisation literature by examining the effect of industry specialist auditor on audit quality for the first time in the U.K. and globally using the partner national-city framework and the joint firm-partner national-city framework.

- The overall results from the audit pricing analysis indicate that audit partner industry leadership at the national level seems to drive the fee premium for auditor industry specialisation in the U.K. above and beyond the audit firm industry leadership. This supports the argument that industry expertise is uniquely attributable to the individual audit partner's human capital in terms of their knowledge and experience gained from leading audit engagements in a particular industry.

- Interestingly, the evidence of a fee premium for industry leadership at the firm level is only supported in the large client sample. This finding is consistent with evidence from New Zealand, Australia and the U.S. where fee premiums for industry leadership are only reported for large clients (Craswell *et al.*, 1995; Francis *et al.*, 2005; Hay and Jeter, 2011). On the other hand, the corresponding analysis at the partner level suggests that the fee premium for industry leadership in the U.K. is driven by partner leadership at the national level in both the large and small client segments.

- Evidence from the sensitivity test also indicates that there is a fee premium attached to female partners, but not the duration of the partner tenure with the client.

- There is no evidence of an audit fee discount applied in the U.K. audit market as reported in the study. Thus, the empirical finding of the fee premium attached universally to the firm and partner industry leaderships indicates a support for the product differentiation theory and reputation theory. This, in turn, suggests that auditors choose to differentiate themselves through industry specialisation to meet clients' demands for better quality audits. This differentiation strategy is valued in the audit market as it is priced at a differentially higher rate above and beyond the generic Big 4 brand name reputation premium.

- The results of the earnings quality analysis indicate that the audit firm joint national and city industry leadership matters more than the partner industry leadership in constraining discretionary accruals (both in magnitude and direction), in reducing accruals estimation error and reducing the likelihood of reporting a profit.

2) This is the first study jointly examining the effect of industry specialist auditors (under the national-city framework) and the corporate governance function on both audit pricing and earnings quality.

- Prior studies on auditor industry specialisation by Francis *et al*. (2005), Basioudis and Francis (2007), Reichelt and Wang (2010), Minutti-Meza (2013), and Nagy (2014) have not considered the effect of corporate governance function in their analyses of audit quality or earnings quality. This does not necessarily reflect the actual reality where it is expected that interdependencies potentially exist between the role of external auditor and company's internal corporate governance mechanisms. Prior literature supports this argument, for example, Bedard and Johnstone (2004) suggest that auditors take into consideration clients' strength of internal control, risk of earnings manipulation and effectiveness of corporate governance in making audit planning and pricing decisions, and then adjust their audit effort and billing rates accordingly. Cohen *et al*. (2007) have reported that auditors' control risk assessments and audit planning decisions are affected by the client board's characteristics and effectiveness. Therefore, this study investigates the effect of industry specialist auditors (under the three national-city frameworks, as discussed in the No. 1 bullet point above) and corporate governance on both audit pricing and earnings quality. By doing so, the study uniquely contributes to the extant literature.

3) The PhD thesis employs various alternative measures of earnings quality in order to have more vigorous and conclusive findings.

- Earnings quality in this study is measured using three different proxies – discretionary accruals (both in magnitude and direction), accrual quality (based on the level of accrual estimation error), and the company's likelihood of reporting a profit rather than a loss. Prior literature has yet to examine these measures of earnings quality in relation to the firm national-city framework in the U.K. On top of that, the relationship between these various measures of earnings quality have never been examined in relation to auditor industry specialisation under the partner national-city framework and the joint firm-partner national city framework within the whole of the prior research literature. Thus, this study fills this gap in the literature globally by examining for the first time, using the firm national-city framework in the U.K., and the partner national-city framework and the joint firm-partner national city framework globally, the effect of auditor industry specialisation on discretionary accruals (both in magnitude and direction), accrual quality (based on the level of accrual estimation error) and the company's likelihood of reporting a profit rather than a loss.

4) This PhD thesis is based on an analysis of more recent data from the period 2008-2011, which is the period during and subsequent to the financial crisis. This is important given the changing financial reporting landscape (higher risk of earnings management) and more regulatory reforms taking place since then, which might yield different results as compared to prior studies. Consistently, research on financial crises (e.g. the Asian crisis and the 2007/2008 financial crisis) has shown that there are various factors that motivate managers to engage in earnings management during the financial crisis period (e.g. Charoenwong and Jiraporn, 2008; Lang and Maffett, 2011; Habib *et al*., 2013), and accruals manipulation is one of the tools that could be used by management to stabilise earnings of current and consecutive periods.

- In the audit quality analysis, the study provides evidence that the audit fee is higher in the presence of an active audit committee and foreign directors on the board. This suggests the presence of foreign directors and an active audit committee contributes to a more extensive and expensive audit.

- Interestingly, the study documented that female directors, audit committee independence and financial expertise contributes to lower earnings quality – higher discretionary accruals and accrual estimation error. This finding is surprising and contrary to the expectations based on the agency theory and the stewardship theory propositions, where the board and audit committee are expected to provide stewardship to shareholders to safeguard their interest. Instead, this finding supports the managerial hegemony theory assertions that the company board's decisions and actions are dominated by the management's pursuit of their self-serving interest; whereas, other corporate governance variables examined provide insignificant results, implying that the role of corporate governance in U.K. public listed firms is only ceremonial in nature, given that the variation between these characteristics among the companies does not contribute to improved quality of financial reporting. This conclusion is also consistent with the proposition underlying institutional theory where companies are assumed to conform to their environmental pressures (for example, to meet the various requirements of the corporate governance best practices such as the Combined Code, 2008, or the U.K. Corporate

Governance Code, 2010) simply to maintain their legitimacy, instead of intending to achieve an effective governance and monitoring role, particularly in the financial reporting process. This interesting finding in respect of corporate governance effectiveness during the sample period 2008 to 2011 could be argued to be partly motivated by the economic and financial conditions during the recent financial crisis where companies were facing a difficult time trying to maintain and improve their performance in the public equity market.

- As the monitoring role of auditors depends on the strength of a firms' corporate governance structure (Larcker and Richardson, 2004), it is possible that the auditor monitoring roles outweigh the oversight functions of boards and audit committees, and hence contribute to the insignificant results for corporate governance variables and earnings management. Taken together, it seems that the ineffective monitoring role of corporate governance in constraining accruals manipulation has been moderated by the presence of industry specialist auditors in the U.K. and in the period 2008-2011.

5) The study contributes to the company board diversity literature in terms of board gender and board nationality, as their monitoring effects on audit fees and different measures of earnings quality is thoroughly examined. There has been a paucity of research of such type in the U.K.; thus, this study fills this gap in the literature and complements other similar board diversity studies carried out in other countries – mostly in the U.S. The findings from this study indicate that higher proportion of foreign directors on the company board contributes to higher audit fees, given their unfamiliarity with the local financial reporting requirements, rules and regulations and management methods that could possibly leads to them exercising a poor monitoring role (Masulis *et al*., 2012). This, in turn, may necessitate the foreign directors to request from the auditor to perform extra work to verify the quality of the financial reports prepared by the management, resulting in the charging of higher audit fees. The study also finds that female directors contribute to lower earnings quality – higher accrual estimation error.

6) This is the first study to examine the effect of competitive pressure on the ability of the industry specialist auditor to extract a fee premium and constrain earnings management in the U.K. setting.

- Consistent with Numan and Willekens (2012) finding in the U.S. audit market, the results of this study indicate that the fee premium for auditor industry specialisation in the U.K. earned by the audit firms, who are joint national and city industry specialists, is not merely due to its successful differentiation strategy, but is also partly driven by the fee pressure from its closest competitor in the city-industry audit market. Nevertheless, the audit firm's position as a joint national and city industry leader in the U.K. already gives it a sufficient market power to extract a fee premium. This is because there is a distinct (non-interdependency) fee premium attached either to the audit firm joint national and city industry leader or to its distance with the closest competitor. This is completely new evidence and needs to be tested over the course of time, as this new evidence is documented during and after the 2007/2008 global financial crisis.

- Also, the study documents that the competitive pressure has an adverse effect on earnings quality. This is based on the evidence that discretionary accruals and accrual estimation error are larger when the distance between the audit firm with its closest competitor is decreasing. Again, this new evidence is documented during and after the 2007/2008 global financial crisis and needs to be tested over the course of time.

1.5 Structure of thesis

This chapter has discussed the background for this study, outlined the study's motives and the research objectives. The contributions made by this study have also been highlighted. The remainder of this thesis is organised as follows.

Chapter 2 provides a review of the literature on auditor industry specialisation and corporate governance and their relation to audit quality and earnings quality. The review of each section concludes with identifying the literature gap and suggestions for bridging this gap.

Chapter 3 discusses the theoretical framework underlying the study, which is employed to explain and analyse the association between audit quality and earnings quality with both industry specialist auditors and corporate governance attributes. Illustrations of the theory adopted for this study are offered and its selection is justified.

Chapter 4 discusses the development of hypotheses to be examined in the study.

Chapter 5 outlines the methodological aspects adopted in this study, including the sample selection process, source of data, model specifications, definition of variables and data diagnostics.

Chapter 6 to Chapter 8 present and discuss the results for the first empirical study on the effect of industry specialist auditors and corporate governance on audit quality: Chapter 6 presents the descriptive statistics, Chapter 7 discusses the multivariate analysis, and Chapter 8 discusses the sensitivity analysis and robustness test for the first empirical study.

Chapter 9 to Chapter 11 present and discuss the results for the second empirical study on the effect of industry specialist auditors and corporate governance on earnings quality. Chapter 9 presents the descriptive statistics, chapter 10 discusses the multivariate analysis, and Chapter 11 discusses the sensitivity analysis and robustness test for the second empirical study.

Finally, Chapter 12 presents the conclusion of the thesis. This chapter also highlights the study's potential limitations and provides recommendations for future research.

CHAPTER 2
LITERATURE REVIEW

2.1 Introduction

This section discusses the key literature pertaining to the topic of the study which involves the generic topics of corporate governance, auditor industry specialisation, earnings management and the relationship that exists between them. At the same time, this section also highlights the gaps in the existing literature and explains how this study can address those gaps and make a contribution to the existing body of knowledge.

2.2 Audit quality

DeAngelo (1981) defines audit quality as the joint probability that material misstatements will be detected and consequently reported by the auditor. Because audit quality is an unobservable concept, various measures have been used to operationalise audit quality. This includes audit fees, the brand name reputation of the Big 4 audit firms, auditor tenure, auditor independence, and auditor industry specialisation, amongst others (Francis *et al*., 1999, Davidson *et al*., 2005; Lin and Hwang, 2010). In this study, audit effort will be measured based on the variation in the level of audit fees charged by auditors. It is assumed that firms pay more to their auditor to receive a higher quality audit (Simunic, 1980). It is not possible to measure audit effort in terms of audit hours, the time, scope and resources contributed by the auditor from outside the black box. However, a study by Caramanis and Lennox (2008) managed to test this using audit fees in terms of audit hours using proprietary data in Greece.

2.3 Earnings quality

The quality of reported earnings is important to investors in the financial market, as investors and analysts heavily rely on the company's reported earnings in making investment decisions. Earnings management is the inverse measure of earnings quality. The generally accepted accounting principles (GAAP) provide flexibility for managers to choose the type of accounting policy or procedures that suit their business operating environment when making assumptions and estimations in the financial reporting process. Hence, managers would be most likely to choose the type of accounting policy or procedure that will maximise the wealth of all the contracting parties (Watt and Zimmerman, 1990). This flexibility in GAAP provides opportunity for earnings management where the company's actual performance is being masked so that shareholders, debt holders and investors at large are being misled about the true economic value of the company (Watt and Zimmerman, 1990; Fields *et al*., 2001).

Whereas Schipper (1989) defines earnings management as intentional intervention in the external financial reporting process, with the aim of attaining personal benefit either for managers or shareholders, for Healey and Wahlen (1999) earnings management happens when managers apply their judgements and structure the transactions to modify the company's financial reporting outcome with the intention either to mislead certain parties about the true economic performance of the company, or to influence contractual outcomes that rely on the reported figures. Schipper's (1989) definition is broader than Healy and Wahlen's (1999) as it emphasis that earnings management is an intentional action, and does not limit the types of accounting manipulation that can be done to include both legitimate (within GAAP) and illegitimate practices (such as accounting fraud). Schipper (1989) also highlights that such earnings management practices could either be opportunistic (for the benefit of managers) or informative (for the benefit of shareholders).

This PhD thesis adopts the Healy and Wahlen (1999) definition of earnings management, which specifically refers to managerial opportunism that is carried out in a legitimate way (within GAAP) to conceal the deteriorating economic performance of the company. Such practices are not informative for shareholders, investors and debt holders as they are being misled about the true economic value of the company. There are a number of reasons why management are involved in earnings management, and these incentives are explained in the next section.

2.3.1 Earnings management incentives

Healy and Wahlen (1999) identify four main types of earnings management incentives, namely capital market incentives, management compensation contracts incentives, debt contracts incentives and political and regulatory requirements incentives.

Capital market incentives exist because market participants and stakeholders appear to reward companies with positive or higher earnings more than companies with negative or lower earnings. Therefore, managers have incentives to manipulate earnings to meet or beat market expectations (analyst forecasts) and thus to influence share prices. This is very true in the U.K. as it is a developed country with a highly dispersed share ownership as well as efficient and liquid stock markets, where investors rely heavily on analyst forecasts in making investments. Bugstahler and Dichev (1997) provide evidence that managers manipulate earnings in order to avoid earnings decreases and losses. They found that low frequencies of small earnings decreases and small losses, and high frequencies of small increases in earnings and small positive incomes are unusual. Barth *et al*. (1999) suggest that companies with patterns of increasing earnings are more likely to have higher firm valuation, as reflected in larger earnings multiples (e.g. higher coefficient of earnings).

The management compensation contract incentives are based on agency theory where the principal monitors agent's behaviour through their compensation contracts in order to align their divergent interests (Jensen and Meckling, 1976). Since compensation contracts are usually linked to accounting numbers, such contracts create incentives for managers to manipulate reported earnings results that maximise the value of their compensation, share options, bonuses and other performance related payments tied to their earnings (Watt and Zimmerman, 1978). According to Healy (1985), when the bonus plans are binding at the minimum or maximum levels, managers are likely to manage accruals upwards (income-decreasing accruals), whereas when the bonus plans are not binding, managers are likely to manage the accruals downward (income-increasing accruals) to drive the earnings higher. When managers are denied bonuses in the current year because the current earnings are extremely low and fail to meet/beat target, they may engage in "big bath accounting" by differing the recognition of revenue or accelerating write-offs to drive the current earnings lower, and reverse these transactions in future years to meet future earnings targets to secure their future bonuses.

The debt contracts incentives are related to the restrictive covenants written in debt agreements with the purpose to constrain the likely conflicts of interest between shareholders and debt holders. The restrictive covenants may include restrictions on payment of dividends or issuance of new debts, or emphasise debt holders' rights to command early debt repayment when certain accounting-based targets are not achieved. Hence, managers' accounting decisions are normally influenced by debt covenants in the year before and the year during the occurrence of the violation (Defond and Jiambalvo, 1994). In order to reduce their debt constraints, managers of defaulting companies are likely to engage in income-increasing accruals when approaching the covenants' violation (Sweeney, 1994).

Finally, political and regulatory requirements incentives such as accounting standards, industrial regulations, tax laws, and listing requirements, amongst others, could also motivate companies to engage in earnings management activities. For example, in the banking industry, managers in banks are likely to manipulate accruals when their capital competence requirements are close to the minimum level (Beaver and Engel, 1996; Liu *et al*., 1997). In the import sector, managers are likely to engage in income-decreasing accruals during the year of an application for import relief to obtain benefits such as higher tariff or reduced quota (Jones, 1991).

In the context of the PhD thesis, all these four incentives are expected to motivate earnings management practices in the U.K. public listed companies. Some incentives may be stronger than others for certain companies, depending on the nature of the industry, financial performance, dispersion of ownership and regulatory constraints affecting their business operation. As earnings management is an unobservable construct (Vafeas, 2005), various measures have been used by researchers in their studies as surrogates. The next section explains the various proxies that will be used to measure earnings management.

2.3.2 Earnings management measurement

Earnings management can be carried out legitimately in several ways, either through manipulation of accrual accounting, income smoothing, earnings restatements, or flexibility of accounting policies/procedures used in financial reporting. Amongst other methods, accrual accounting seems to be the most favourable method for management as it cannot be easily observed and does not involve high cost to practice (Young, 1999). Accruals can be distinguished into two parts, namely the discretionary accruals and non-discretionary accruals. The discretionary accrual is a topic of interest in earnings management research as it can be manipulated by management using their judgement and discretion to produce higher or lower earnings in their favour. The measurement of discretionary accruals can be classified into three categories, namely the aggregate accruals models, specific accruals models and the frequency distribution approach (McNichols, 2000).

Aggregate accrual models include Healy's (1985) model, DeAngelo's (1986) model, Jones's (1991) model, the modified Jones model from Dechow *et al*. (1995), and the Kothari *et al*. (2005) performance-adjusted discretionary accruals model. These different models apportion the non-discretionary accruals parts from the total accruals in different ways and have different ability to cope with changes in the company's economic condition. It is argued that the assumption of constant non-discretionary accruals in the Healy (1985) and DeAngelo (1986) models is unrealistic as the change in accounting accruals is dependent on the company's economic condition (Kaplan, 1985). However, the Jones (1991) model, the modified Jones model by Dechow *et al*. (1995) and the Kothari *et al*. (2005) performance adjusted discretionary accruals model resolve this problem as they takes into account the changes in a company's economic conditions as measured by the fluctuation in revenues, assets, receivables and return on assets (performance). The Jones (1991) and modified Jones models are recognised in the literature as the most powerful models for detecting earnings management (Dechow *et al*., 1995; Young, 1999). However, the limitation of the aggregate models is the risk of misspecification due to their inefficiency in isolating the discretionary component of total accruals (Dechow *et al*., 2010).

The specific accruals models estimate the discretionary accruals based on a single accrual item such as residual provision for bad debts (McNichols and Wilson, 1988), loan loss provisions (Beaver and Angel, 1996; Collins *et al*., 1995), provision for tax expenses (Philips *et al*., 2003) and the loss reserves of property and casualty insurers (Petroni, 1992). As compared to the aggregate accruals models explained earlier, the specific accrual model is less comprehensive and could be misleading when it does not capture the full earnings management if the manipulation also affects other parts of the discretionary accrual component (McNichols and Wilson, 1988).

The frequency distribution approach is introduced by Burgstahler and Dichev (1997) and Degeorge *et al*. (1999). The approach is more focused as it examines the earnings behaviour when it is carried out with a specific intention or target such as to avoid earnings decreases or losses, to sustain recent performance, to report positive profits, and to meet or beat analysts' forecast. However, it is argued that the frequency distribution approach only provides specific predictions on whether companies engaged in earnings management activities but do not actually measure the magnitude of managers' opportunistic earnings (McNichols, 2002).

For this PhD thesis, three measures of accruals have been selected, where the discretionary accruals and the accrual estimation error falls under the aggregate accruals category, while the likelihood of reporting a profit rather than a loss falls under the specific accruals category. The aggregate accruals measure allows the study to examine the magnitude of earnings management in relation to the role of corporate governance and industry specialist auditors. However, the frequency distribution approach can only suggest predictions, and does not confirm the act and magnitude of earnings management (McNichols, 2002). The respective earnings management models that will be used in the study are further discussed in Chapter 5 on Research Methodology.

2.4 Auditor industry specialisation

This section explains the role of an industry specialist auditor and the developments in the identified sources of auditor industry specialisation. In addition, this section also discusses the effect of industry specialist auditors on audit fees and the various financial reporting outcomes.

2.4.1 Role of industry specialist auditor

Auditor industry specialisation is a product differentiation strategy adopted by the audit firms to differentiate themselves from competitors in fulfilling clients' demands for better financial reporting quality (Krishnan, 2003; Dunn and Mayhew, 2004) and to compete on other than cost-price strategy alone (Gramling and Stone, 2001; Mayhew and Wilkins, 2003; Habib, 2011). By concentrating resource and technology investments in a particular focus industry or a number of industries, audit firms are able to gain efficiency through economies of scale (Eichenseher and Danos, 1981; Cairney and Young, 2006) and build their reputation as an industry expert. The reputation gained from being an industry specialist auditor would provide them competitive advantage and greater market power (bargaining power) over their rivals, which will allow them to charge a differentially high audit fee premium (Hay and Jeter, 2011), both over existing or potential clients (Causholli *et al*., 2010).

The extensive industry-specific experience of the industry specialist auditor (Gramling and Stone, 2001) allows them to identify and address industry specific problems and issues more thoroughly than auditors who do not have that domain-specific knowledge (Craswell and Taylor, 1991; Eichenseher and Danos, 1981). Industry specialist audit firms are also more likely to make investments of expertise beyond the general expertise of the audit firms (in personnel, technologies, and control systems) so as to improve their reputation and quality of audits in their focus industries (Simunic and Stein, 1987; Craswell *et al*., 1995). Experimental research on auditing also reported evidence that industry expertise generally enhances auditor judgment (Moroney, 2007), improves the quality of the auditor's risk assessment (Taylor, 2000; Low, 2004), as well as improves the accuracy of error detection (Solomon *et al*., 1999; Owhoso *et al*., 2002). Industry specialist auditors are also more likely to recognise loss in a timely manner (Krishnan, 2005).

Researchers of archival studies developed their own measures of industry specialist auditors based on within industry market share approach as an indirect proxy for industry specialisation (Ferguson *et al*., 2003; Francis *et al*., 2005; Minutti-Meza, 2013). This is because the industry expertise of the audit firm at the national, city and partner level is not directly observable (Minutti-Meza, 2013). Thus, industry specialist is defined as the auditor that has "*differentiated itself from its competitors in terms of market share within a particular industry*" (Neal and Riley, 2004: 170).

Kwon *et al*. (2007) investigate the role of auditor industry specialisation in an international context. Using a sample from 28 countries in the period 1993 to2003, they found that clients of industry specialist auditors have low discretionary accruals and high earnings response coefficients (ERC). They also find that auditor industry specialisation has a more positive effect on earnings quality in countries with a weak legal environment than in countries with a strong legal environment. Their findings suggest that auditor industry specialisation may be a substitute for other corporate governance mechanisms, as corporate governance is usually weaker in weak legal environments than in strong legal environments (La Porta *et al*., 1997; DeFond and Hung, 2004).

Given that auditor industry specialisation is associated with higher audit quality, it is important to understand the different sources of auditor industry specialisation and its implication on audit quality. The next section further discusses this.

2.4.2 Different sources of auditor industry specialisation

Researchers to date have identified three sources of auditor industry specialisation: the firm-wide level, the city-industry level or the partner level. Prior studies have also found evidence of a differential fee premium and financial reporting quality attached to each of these different levels of industry specialisation, or combination of them, which will be discussed further in the following sections.

2.4.2.1 National level industry specialisation

Initial studies on auditor specialisation focused their attention on national level audit industry specialisation (e.g. Palmrose, 1986; Craswell *et al*. 1995; DeFond *et al*., 2000; Ferguson and Stokes, 2002), and assumed that audit quality and industry expertise are homogeneous within the audit firms, and across their offices of various sizes situated in different cities (Ferguson *et al*., 2003; Choi *et al*., 2010). The argument is that all the individual offices of the same audit firm received standardised national training programmes, adopted standardised audit programmes, and engaged in sharing of audit staff between the offices in different locations either through physical travel or through the use of information and communication technologies (Ferguson *et al*., 2003). This is apparent given the claims made by large audit firms on their websites and in the media that they have " *firm-wide operations organised along industry lines*" (Ferguson *et al*., 2003) and have a standardised audit quality throughout all their offices around the world due to the existence of standardised quality control procedures. From this perspective, auditor industry expertise is measured using the audit firm's market share based on client total assets, total sales, audit fees or number of clients in an industry with a specific cut-off (e.g., 10 percent, 15 percent, 20 percent) in order to separate industry specialist auditors from non-industry specialist auditors (e.g. Craswell *et al*., 1995; Ferguson and Stokes, 2002; Hay *et al*., 2006). In cases where there are two top audit firms with the highest market share per industry, then the alternative measurement of ranking is made by determining which one of them is also a city-specific industry leader (Ferguson *et al*., 2003).

2.4.2.1.1 The relationship between audit firm national level industry specialisation, audit quality and earnings quality

Studies on fee premium attached to auditor industry specialisation at the national level produce mixed results. While many studies find evidence of fee premium (e.g., Craswell *et al*., 1995; DeFond *et al*., 2000; Mayhew and Wilkins, 2003; Casterella *et al*., 2004; Carson, 2009), other studies find no relation (e.g., Palmrose, 1986; Pearson and Trompeter, 1994; Ferguson and Stokes, 2002) or even a fee discount (e.g., Ettredge and Greenberg, 1990). Palmrose's (1986) study using U.S. data obtained from a questionnaire survey between the period 1980 to 1981 reports that Big 8 auditors do not earn any specialist premium. Pearson and Trompeter's (1994) study of U.S. insurance companies between the period 1982 to 1986 documented that Big 8 auditors also do not earn any specialist premium using national market share measures of industry expertise. On the other hand, a study in Australia by Craswell *et al*. (1995) using 1987 data found evidence of fee premium for the Big 8 auditors but only if the specialisation measure uses a less than 20 percent market share threshold. The issue was revisited by Ferguson and Stokes (2002) who found that, in the same setting, a premium for specialisation no longer applied after the mergers that reduced the Big 6 firms to the Big 5.

Fields *et al*. (2004) conducted a study of U.S. financial institutions in the year 2000 and also reported an absence of a fee premium attached to Big 5 industry specialists. A study by Casterella *et al*. (2004) in the U.S.A. using survey data from 1993 documented that the Big 6 industry specialists only earned a premium for small companies in the sample. Ferguson and Stokes' (2002) study in Australia between 1990 and 1998 found limited support for the existence of a specialist premium. Using 1992 Hong Kong data, DeFond *et al*. (2000) found evidence of a fee premium for Big 6 industry specialists, while Mayhew and Wilkins (2003) selected a sample of initial public offerings (IPOs) and found that audit firms that possessed significantly higher market shares than their industry competitors earned fee premiums. A study by Casterella *et al*. (2004) in the U.S. used self-reported audit fee data to provide evidence of fee premiums for industry specialists, but only for smaller companies that have little bargaining power. Huang *et al*. (2007) extended the Casterella *et al*. (2004) study by using the disclosed audit fee data from 2000 to 2004 and found a negative association between client bargaining power and audit fees for both the small and large client segments in the post-Sarbanes–Oxley (SOX) period. However, Carson and Fargher's (2007) study in Australia from 1998 to 2004 reported that Big 6 audit firms who national-level industry specialists only earned fee premiums from servicing their large clienteles. Finally, a cross country study by Carson (2009) covering 62 countries in 2000 and 60 countries in 2004 reported that there is a fee premium attached to global industry specialists. Cahan *et al*. (2015) attribute this mixed finding to the failure of academic researchers to consider audit firm strategies for achieving high market shares. The authors find significantly higher (lower) audit fees when the auditors attain a high market share by auditing a relatively lower (higher) proportion of clients in the market.

Prior studies using the national measure of auditor industry specialisation report evidence of higher audit quality and earning quality provided by audit firms who are national industry leaders as compared to their non-specialist counterparts. These studies demonstrated that audit firm national industry leadership contributes to lower discretionary accruals (Krishnan, 2003; Balsam *et al*., 2003), higher ERC (Krishnan, 2003), higher disclosure quality (Dunn and Mayhew, 2004), lower incidence of financial fraud (Carcello and Nagy, 2004), increased reporting conservatism through timely loss recognition (Krishnan, 2005; Lim and Tan, 2009), reduced propensity of earnings to just meet or beat analyst forecasts (Payne, 2008) and lesser likelihood of financial restatements (Romanus *et al*., 2008). Carson (2009) documents a fee premium at the global audit firm network level, suggesting that global industry specialists possess a competitive advantage in terms of international expertise relative to national expertise alone.

Nevertheless, evidence of a fee premium documented for industry specialisation seems to favour certain client segments only. For instance, studies by Craswell *et al*. (1995), Ferguson and Stokes (2002), Ferguson *et al*. (2003), and Carson and Fargher (2007) in Australia report that the fee premium only applied to large clients. In the U.S., however, the evidence is inconclusive: Casterella *et al*. (2004) and Huang *et al*. (2007) report a premium that applies only to large clients, but Francis *et al*. (2005) did not find evidence of premiums for large clients. Casterella *et al*. (2004) assert that larger clients exert greater influence on their auditor in negotiating fee premiums.

In respect of earnings quality, Carcello and Nagy (2004) document evidence that industry specialist auditors are more likely to constrain fraudulent reporting practices, but this effect is only stronger in small clients. This indicates that the larger clients have greater bargaining power and are able to influence the auditor to be less aggressive in the financial reporting (McKeown *et al*. 1991). Another possible explanation is that the auditor might face challenges in dealing with larger, more complex clients with wide business portfolio across different industries (Carcello and Nagy, 2004). In addition, Stanley and DeZoort (2007) found that those industry specialist auditors are more likely to reduce financial restatements during initial engagement periods.

2.4.2.2 City or office level industry specialisation

However, it is important to realise that despite the large audit firms having an international and country level organisational structure, their operation is decentralised to a network of semi-autonomous practice offices (Wallman 1996; Francis *et al*. 1999: Ferguson *et al*., 2003). In this sense, each individual practice office of the large audit firm should be treated as a unique and relevant unit of analysis. The argument is that audit contracting is done through local offices, audit engagements are managed by the audit team usually located in the same city as the audit client's headquarters, and audit reports are issued on office-specific letterhead of the Big Four engagement office managing the audit (Wallman 1996; Francis *et al*. 1999; Reynolds and Francis 2000, Ferguson *et al*., 2003; Francis, 2004). Hence, industry expertise represents an investment in the unique professional staff (human capital of the firm) and this expertise is gained by working with clients in specific industries, and, hence, tend to be client-specific and office-specific (Solomon *et al*., 1999; Ferguson *et al*., 2003). From this perspective, industry specialist auditors are either ranked based on a city-specific industry leadership framework (e.g. Basioudis and Francis, 2007) or the overall city leadership framework (e.g. Ferguson *et al*., 2006) where the audit firm’s city-specific market share is calculated based on client total assets, total sales, audit fees or number of clients. In the overall city leadership framework (e.g. Ferguson *et al*., 2006), however, the industry specialist auditor market share is calculated based on the overall client total assets, audit fees or number of clients for the individual offices of the same audit firms located in different cities. The fact that city-specific industry leadership is a more accurate measure of an industry specialist auditor relative to national leadership is evidenced by the findings that industry leaders alone do not earn any audit fee premium unless they are also a city leader or city-specific industry leader (Ferguson *et al*., 2003; Francis *et al*., 2005; Ferguson *et al*., 2006; McMeeking *et al*., 2006; Basioudis and Francis, 2007; Reichelt and Wang, 2010).

The argument for the city-specific perspective has been further extended recently to the size of the local practice office (hereon referred to as the "office size") of audit firms located in different cities (Francis and Yu, 2009; Choi *et al*., 2010). It is argued that the larger the office size, the better the professional staff in-house experience and expertise in performing the audit for large clients, as compared to smaller size offices of the same audit firm. Also, it is argued that because large offices normally have a larger client base and there is shared monitoring among partners, they would be less economically dependent on any specific or individual client, and are less pressurised by clients for sub-standard reporting (Francis and Yu, 2009). Hence, it is reasonable to assume that auditors in large offices are more likely to provide higher audit quality to protect their large client base as compared to smaller size offices with a smaller client base (Choi *et al*., 2010). Accordingly, studies have reported that discretionary accruals (proxy for earnings management) is lower for companies audited by the large city offices of audit firms as compared to small city offices (Francis and Yu, 2009; Choi *et al*., 2010). Taking this view, the office size is measured in two different ways based on: 1) the number of audit clients in each office, and 2) the total auditor fees earned by each office (Choi *et al*., 2010).

2.4.2.2.1 The relationship between the audit firm city level industry specialisation, audit quality and earnings quality

Using each engagement office as the unit of analysis, a study by Reynolds and Francis (2000) in the U.S. documented that the Big 5 city-specific industry leaders are more conservative in their large client's reporting. Similarly, Carson and Fargher (2007) documented that an industry specialisation premium is only gained from auditing large clients at the city level. Recent research on auditor industry specialisation examines the effect of the Big 4 industry leadership on audit pricing using the national-city framework developed by Ferguson *et al*. (2003) to determine whether national (firm-level) reputations or city reputations (office-level) for industry expertise are more valued and more highly priced in the audit market (Ferguson *et al*. 2003; Francis *et al*., 2005; Basioudis and Francis, 2007; Hay and Jeter, 2011). Whether the audit pricing is dominated by firm-level or office-level industry expertise might explain the strength of knowledge sharing and transfer of industry expertise between the city-offices of the audit firms. The results of this line of research have so far been inconclusive. In the U.S. and Australia, auditors' industry expertise based on joint national and city reputation matters more in the Big 4 audit market as they are priced at a higher rate compared to national industry leadership alone or city-specific industry leadership alone (Ferguson *et al*., 2003; Francis *et al*., 2005). On the contrary, in New Zealand the industry specialisation premium for city-specific industry leadership alone appears to be higher than joint national-city industry leadership (Hay and Jeter, 2011).

Using data from the period 1985 to 2002, McMeeking *et al*. (2006) found evidence of an audit fee premium for large audit firms in the U.K.. However, the existence of such a premium for auditor industry specialisation is only significant when the industry specialist auditor is both a national leader and a city-industry leader. No premium is reported when the audit firm is a national leader alone. A subsequent study by Basioudis and Francis (2007) documented similar findings using 2002 and 2003 data. They found that the city-specific industry leader earns an audit fee premium of about 19 percent, whereas the national leader alone does not earn any. However, the audit fee premium drops to 12 percent when the industry specialist is a joint national and city-specific industry leader. The results of both studies by McMeeking *et al*. (2006) and Basioudis and Francis (2007) reinforce that there is either no or low distribution of knowledge between offices of the audit firms in the U.K., and that the U.K. national industry leadership is mainly city-specific, as national leadership alone in the U.K. does not earn any fee fermium. This is in contrast to findings in the U.S. and Australia, where there is evidence of at least some knowledge sharing across the Big Four offices (Ferguson *et al*., 2003; Francis *et al*., 2005). This is evidenced by an average premium of 24 percent in Australia, and 17 percent in the U.S. when the audit is jointly affected by the city and national industry leadership, but not for national industry leadership alone (Ferguson *et al*., 2003; Francis *et al*., 2005). The findings by McMeeking *et al*. (2006) and Basioudis and Francis (2007) overturn the earlier expectation that national level industry leadership might be relatively more important than city-specific reputations in a smaller country with a relatively centralised economy like the U.K. (Basioudis and Francis, 2007). However, the U.K. evidence to date is similar to New Zealand in showing that the Big 4 city-specific industry leadership alone matters more than joint national and city-specific industry leadership, as it is able to earn higher fee premiums. Also, no significant fee premium is reported for Big 4 national industry leaders in the U.K. relative to other Big 4 auditors that are not national industry leaders. The prior U.K. results imply that knowledge sharing and transfer in respect of industry expertise does not occur across the city-offices of the Big 4 firms.

In respect of the audit office size, Choi *et al*. (2010) show that the office size has a stronger positive effect on fee premium size and has significantly positive relations with audit quality (measured by lower level of accruals), even after controlling for national-level audit firm size and office-level industry expertise. Consistently, Francis and Yu (2009) also found that the Big 4 office size is positively associated with accruals, auditors' likelihood to issue going-concern opinion and the likelihood of meeting earnings benchmarks.

This premium is further supported by evidence showing that city-specific industry specialist auditors are associated with lower discretionary accruals (Reichelt and Wang, 2010; Sun and Liu, 2013), are less likely to meet or beat analysts' earnings forecasts by one penny per share (Reichelt and Wang, 2010) and are more likely to be issued a going-concern audit opinion (Reichelt and Wang, 2010). Gunny *et al*. (2007) documented that auditor industry expertise at the city level is more important than the auditor tenure in mitigating the possibility of receiving both audit and serious deficiency reports from the Public Company Accounting Oversight Board (PCAOB).

2.4.2.3 Partner level industry specialisation

Nevertheless, more recent and concurrent studies have pushed the local analysis one step further to the engagement partner-level. This is based on the argument that industry expertise is uniquely attributable to the individual audit partner human capital in terms of their knowledge and experience from leading audit engagements in a particular industry (Chi and Chin, 2011). It may not be possible to fully transfer the audit partner deep expertise between offices and among other audit partners practicing in the same audit firm due to the reasons that 1) not all types of knowledge within the audit firm can be documented and transferred, 2) an individual audit partner's professional judgement is unique, 3) information technology expert knowledge systems are not automatically embraced by everyone, and that 4) "*evaluation apprehension, performance based compensation schemes and individual auditors' pursuit of personal benefits and power may deter auditors from sharing what they know with others*" (Vera-Munoz *et al*., 2006). Furthermore, the additional industry-specific and client-specific information held by the audit engagement partner places him/her in a better competitive position relative to his/her peers, which may result in higher economic benefits in terms of remuneration and reputation. In addition, studies on tacit knowledge suggest that industry expertise develops from individual personal beliefs, experiences and values and is not easily transferred because it is subconsciously understood and applied (Ambrosini and Bowman, 2001; Carcello and Nagy, 2004; Nagy, 2014). Hence, it would be acceptable to claim that audit quality is not only a product of an audit firm's brand name, but also the characteristics and reputation of the audit partner itself.

2.4.2.3.1 The relationship between the audit firm national level industry specialisation, audit quality and earnings quality

Goodwin and Wu (2014) in their study in Australia, reported evidence of fee premium only for companies audited by partners who are industry leaders at the city level, suggesting that partner level expertise is the driver of the audit fee premium for industry expertise. Their results are consistent when they control for either the top first, top second or the top three ranked city partners. On the other hand, Nagy (2014) found evidence using U.S. data to suggest that auditor specialisation at both the partner- and office-levels is associated with a fee premium and that there is no significant difference between partner- and office-level specialisation effects in regards to fee premiums. Zerni *et al*. (2011) also report a premium for partner industry specialisation in Sweden. Consistent with this, a study in Taiwan by Chin and Chi (2009) documents that partner industry specialists reduce restatements. Chi and Chin (2011) further provide evidence that differential discretionary accruals due to industry expertise are driven by a combination of firm and partner expertise, whereas the differential likelihood of a modified audit opinion is primarily attributable to signing auditor specialists.

2.4.2.4 Additional literature on auditor industry specialisation

Mayhew and Wilkins (2003) find premiums only for specialists who have a significantly larger market share than their competitors. Cahan *et al*. (2011) find the specialist premium to be inversely related to the proportion of industry clients audited by the specialists. Minutti-Meza (2013) found that while positive association exists between industry specialist auditors and audit fees and audit quality, the study found that there are no statistically significant differences in any of the audit quality proxies between the two groups of auditors, and no consistent evidence supporting the existence of a specialist fee premium after matching clients of specialist and non-specialist auditors on a number of dimensions, as well as controlling for client fixed-effects.

Fung *et al*. (2002) examined the effects of city-level auditor industry specialisation and scale economies on audit pricing in the U.S. during the 2000 to2007 period, where the scale measure was based on percentile rankings of the number of audit clients at the city-industry level. They document significant specialisation premiums and scale discounts in both the pre-SOX and post-SOX periods. However, the effects of industry specialisation and scale economies on audit pricing are highly interactive. The negative effect of city-industry scale on audit fees is only obtained for clients of specialist auditors. By contrast, clients of non-specialist auditors obtain scale discounts only when they enjoy strong bargaining power, suggesting that auditors are forced to pass on scale economies to clients with greater bargaining power.

Cahan *et al*. (2015) documented that the ability of an industry specialist auditor to charge fee premiums is reduced in the case of clients who are highly differentiated based on firm-specific investment opportunity sets (IOS), as the knowledge gathered in auditing other clients within the industry is often not applicable to clients in more unique IOS environments. This study contributes to the literature by showing that industry specialist premiums are not constant for firms in the same industry; rather, they reflect a trade-off between firm- and industry-specific knowledge.

Using the spatial competition theory, Numan and Willekens (2012) examined the effect of market share distance between the industry specialist audit firm and its closest competitor within the city-industry audit market on the fee premium of the industry specialists in the U.S.. They document that audit fees increase in both auditor-client industry alignment and industry market share distance to the closest competitor. They also found that the fee premium of the industry specialist auditor drops as the distance with the closest competitor becomes smaller. Their study has important implications as it indicates that the market share-based measures of industry specialisation pick up both auditor-client alignment effects (market power through specialised knowledge) as well as market share distance effects (market power through differentiation from the closest competitor). Subsequently, Numan and Willekens (2014) examined the effect of competitive pressure from close competitors on audit quality provided by the industry specialist auditor. They found that audit quality diminishes with increased competitive pressure from close competitors within the city-industry audit market. This is evidenced by the lower likelihood of issuing a going concern opinion to a financially distressed company, higher discretionary accruals and higher likelihood of financial restatements as the market share distance with the closest competitor becomes smaller. They also found that the industry expertise dominance that an industry specialist auditor has over its closest competitor is the primary driver of audit quality, instead of industry leadership *per se*.

2.5 Corporate governance

This section provides a definition of corporate governance from various perspectives and highlights the issues surrounding it. It also discusses the three important dimensions of corporate governance, namely the board of directors, audit committee and the internal audit function.

2.5.1 Corporate governance definition

Corporate governance has been defined in various ways based on different theories adopted, perspectives and interests of the parties which are involved and affected by the corporate governance system (Solomon, 2007). The most widely recognised definition of corporate governance is offered by Sir Adrian Cadbury (Cadbury Report, 1992), which succinctly and clearly defines corporate governance as "*the whole system of controls, both financial and otherwise, by which a company is directed and controlled*". From the shareholder's point of view, Denis (2001: 192) describes corporate governance as "*a set of institutional and market mechanisms that aim to motivate self-interested managers to maximise the shareholders' wealth, measured by the value of the residual cash flows of the companies*". Focusing more on investors' protection, Shleifer and Vishny (1997: 737) describe corporate governance as "*dealing with the ways in which suppliers of finance to corporations assure themselves of getting return on their investment*". These definitions are based on agency theory, which associates corporate governance with the issue of ownership and control and maximisation of shareholders' wealth. Based on the above definitions, it can be seen that corporate governance is a relatively new discipline which is still evolving. It began from the original idea of corporate governance being the relationship between a company and its shareholders, to the web of relationships between a company and all its stakeholders. According to Mallin (2010: 13), "*corporate governance has only relatively recently come into prominence in the business world, and the term 'corporate governance' itself and its everyday usage in the press is a new phenomenon in the last 15 years*".

Based on the more recent corporate governance regulatory developments in the U.K., the Walker Review (2009: 19) describes the role of corporate governance as one which "*protects and advances the interests of shareholders through setting the strategic direction of a company and appointing and monitoring capable management to achieve this*". The U.K. Corporate Governance Code (2010:1) refers to the purpose of corporate governance as being to "facilitate effective, entrepreneurial and prudent management that can deliver the long-term success of the company". Hence, the role of corporate governance is to be distinguished from the management executive role, as it focuses on monitoring and directing activities instead of being involved in the daily operation of the business. Consistent with this, Du Plessis *et al*. (2011: 81) summarise the board functions and responsibilities as being to "*direct, govern, guide, monitor, oversee, supervise and comply*". "The board sets the link between managers and investors, and is essential to good corporate governance and investor relations" (Mallin, 2010; 164).

The board structure in the U.K. takes the form of a unitary ("one-tier") board, where all the directors are working to achieve the same purpose. This is in contrast to the dual ("two-tier") board system practiced in other European countries such as Germany, where the board function is divided into two boards, namely the *supervisory board* and the *management board*, so that there is a clear distinction between management and control. Given the U.K.'s unitary board system, structural issues such as the separation of the role of Chairman and Chief Executive Officer (CEO), the balanced composition of executive and non-executive directors, and the appointment of sub-committees such as an audit committee, nomination committee, remuneration committee and risk management committee becomes important. This is to ensure that all the board decisions are made in the best interests of the company and that the decisions are made objectively without any individual or group of individuals dominating the board's decision making.

Furthermore, the fact that rewards are linked to the performance of the directors gives rise to accountability problems and scrutiny issues. For example, the recent financial crisis can be linked to the corporate governance failures in the banking industry, specifically 1) the failure of the boards of directors, particularly the independent non-executive directors in their monitoring role over risk management activities, and 2) the inappropriate and lucrative performance-related remuneration packages provided to the directors and managers of the banks encouraging them to engage in risk taking activities (MacNeil, 2010: 518; Walker Review, 2009). In addition, the bank failures raise questions about the value of company audits, auditor independence and quality of audit work, as well as the competency and knowledge base of the auditors (Sikka, 2009). These accountability issues raise the need to examine the effectiveness of the existing corporate governance regulations and implementation, as well as the quality of the audit, particularly in the public listed firms where the interests of a large number of stakeholders are at stake.

Accordingly, the U.K. Corporate Governance Code (2010), published in June 2010, was drafted by the FRC to accommodate the lessons learned from the financial crisis, and was subsequently revised in 2012 and 2014. This code of best practices is proposed for the U.K. public listed companies to comply with, or if not, to explain in their annual report reasons for such non-compliance (FRC, 2010). The subsequent sections will discuss the corporate governance characteristics that will be examined in this study in light of their contribution to the financial reporting process.

2.5.2 Board diversity

The board of directors represents the cornerstone of corporate governance as they have the power to override management decisions (Fama and Jensen, 1983). Based on prior literature and the recent regulatory developments in the U.K., the characteristics of board effectiveness that are examined in this study is board diversity in terms of gender and nationality.

2.5.2.1 Female directors

Female directorship is one of the core characteristics of corporate governance in the U.K., and it is believed that it contributes to better overall financial reporting quality.

The U.K. Corporate Governance Code (2010, 2012, 2014) recommends that board members be appointed “on merit, against objective criteria and with due regard for the benefits of diversity on the board, including gender” (Principle B.2). Also, in 2010, the U.K. government commissioned Lord Davies to carry out an investigation identifying the reasons for why women have been precluded from holding top executive positions in U.K. publicly listed companies, and to provide recommendations for improvements in gender diversity on boards.

Prior research pertaining to gender differences identified a few factors which differentiate the effectiveness of male and female workers in their board representations which can be observed in terms of leadership style (Nielsen and Huse, 2010), behaviour and skills (Yukl, 2002) and greater demand for effective monitoring in order to protect their reputation in the capital markets (Gilson, 1990).

Thomas and Ely (1996) assert that the representation of female directors on boards brings more synergy to the board functionality, and the effect of such synergy is double if new male board members are recruited given the same level of qualification and capabilities. Several studies (Clarke, 2005; Huse and Solberg, 2006) have stressed that boards with female directors are more deliberate and thorough in their discussion and decision making, and are more likely to give due consideration to difficult issues that are normally taken for granted by all male boards. Joy (2008) highlighted that female directors' communication skills help facilitate more effective communication between the board and investors. Improvements in board deliberation and communication are expected to contribute to better monitoring ability (Terjesen *et al*., 2009).

Female directors are reported to exercise greater diligence in their monitoring role, as evidenced by their ability to improve board attendance rate, improve CEO accountability, and higher participation in committees charged with governance and auditing (Adams and Ferreira, 2009). In terms of financial reporting outcome, prior studies have reported that the presence of female directors on board and audit committees reduces earnings management activities through accruals manipulation (Srinidhi *et al*., 2011). Gul *et al*. (2008) documented that auditors exert higher levels of effort in auditing companies with female directors as compared to male directors given their high concern for audit and risk oversight and controls (Rosener, 2003). Female directors also contribute to increased disclosure and decreases in the cost of capital (Gul *et al*., 2010). A U.S. study by Gul *et al*. (2011) found that "*stock prices of companies with gender-diverse boards reflect more company-specific information after controlling for corporate governance, earnings quality, institutional ownership and acquisition activity*". Taken together, female participation on board and audit committees is viewed as contributing to better financial reporting quality and improved investor confidence in the quality of the reported earnings.

Nevertheless, there are also studies suggesting the negative effect of having female directors on boards, such as increased firm costs due to higher turnover and absenteeism (Cox and Blake, 1991), the notion that women are more risk-averse than men (Jianakoplos and Bernasek, 1998), and the increased likelihood of conflict when women are the minority gender representative (Richard *et al*., 2004). In other words, more gender diversity may not necessarily contribute to more effective monitoring as they are discriminated against and not given fair and equal say in their role relative to men (Carter *et al*., 2003).

On the other hand, prior research on other countries besides the U.S. has failed to find a significant relationship between the percentage of female members of U.S. boards and several accounting measures of financial performance. This includes studies from the U.S. (Shrader *et al*., 1997), Sweden (Du Rietz and Henrekson, 2000), Denmark (Smith *et al*., 2006; Rose, 2007) as well as cross-country studies of over 500 of the largest firms from three Scandinavian countries, namely Denmark, Norway and Sweden (Randøy *et al*., 2006). Ye *et al*. (2010) report that in China the gender of top executives has no effect on earnings quality, as measured by i) the accuracy of current earnings in forecasting future cash flows, ii) earnings persistence, iii) absolute magnitude of discretionary accruals and iv) the association between earnings and stock returns. These findings indicate that the effect of gender diversity between countries varies. Nevertheless, none of these studies have explored the effect of gender diversity in the U.K. market.

2.5.2.2 Foreign directors

Given the increasing internationalisation of business, there has been a higher demand for nationality diversity of board members in order to gain easy access to the knowledge and contacts in foreign markets where the directors originate (Carpenter *et al*., 2001).

The literature suggests that foreign directors go beyond financial contributions and extend to the provision of managerial expertise and technical collaborations, increasing creativity and innovation. Directors with different nationalities introduce heterogeneity of ideas, experiences and points of view (Ezat and El-Masry, 2008; Samaha *et al*., 2012). Further, diversity on boards may reduce information asymmetry and the associated agency costs, improve the financial flexibility of domestic firms by increasing the pool of potential investors and financing opportunities, and expand cross-border flows of knowledge and technology (Fogel *et al*., 2013). Following this line, Carter *et al*. (2003) found a significant positive relationship between the percentage of ethnic minority directors on the board and Tobin's Q (as a measure of firm performance). Similarly, by using a sample of firms with headquarters in Korea, Choi *et al*. (2007) indicate that there is a significantly higher value for firms that have outsider Anglo-American board members.

Nevertheless, reviews of diversity research (Konrad and Kramer, 2006; Ruigrok *et al*., 2007) assert that task-related diversity contributes to positive cognitive and signalling consequences (e.g. creativity, innovation) but relations-oriented diversity leads to negative communication and affective consequences such as lower decision speed, misunderstandings, and conflicts (Konrad and Kramer, 2006; Ruigrok *et al*., 2007). These dissimilar others are likely to show lower commitment to the organisation, express less satisfaction, perceive more discrimination, and display a variety of other negative behavioural and attitudinal outcomes (Jayne and Dipboye, 2004). According to Masulis *et al*. (2012), foreign directors are likely to be less familiar with national accounting rules, laws and regulations, governance standards, and management methods, making it more difficult for them to evaluate managerial performance or challenge managerial decisions. Their results find that firms with foreign directors in the U.S. exhibit significantly lower performance (returns on assets), especially when they do not have a significant business presence in their home region. In this line, relational demography research in psychology has also shown that working with demographically dissimilar others is often associated with negative outcomes (Riordan, 2000). Another reason to expect a negative influence of foreign directors on firm performance is that on bank boards most foreign directors represent investors who have different investment horizons and who are primarily oriented towards stock market-based measures of performance. As a result, foreign directors who represent foreign fund managers may be much more likely to be concerned about selling the shares of an underperforming company than investing time and energy in instituting a process of corporate restructuring (Douma *et al*., 2006). Based on the theory and conflicting empirical evidence, the effect of foreigners on banks' boards can be negative or positive.

2.5.3 Internal audit

The International Auditing Standard (ISA 610) prescribe that the auditor could rely on the work of the internal audit of the client, and consider its effectiveness in determining the nature, timing and extent of audit procedures to be performed during the audit. A review study on the auditor reliance on internal audits by Bame-Aldred *et al*. (2013) concludes that the auditor reliance on the client's internal audit function has an impact on litigation risk, audit efficiency, audit fees, financial statement quality, and internal control quality. Consistent with this, Felix *et al*. (2001) report evidence of decrease in audit fees by 18 percent as a result of effective coordination with the internal audit function of the client's company.

In recent years, the role and scope of the internal audit does not solely focus on evaluating and improving the firm's internal control, but also includes corporate governance and risk management (IIA, 1999; Cohen *et al*., 2004; Gramling *et al*., 2004). This emerging role of the internal audit would surely have an effect on the external auditors' reliance decisions (Munro and Stewart, 2010; Schneider 2009). According to Goodwin-Stewart and Kent (2006), companies are more likely to use an internal audit when agency costs are high (Adams, 1994). The internal audit function plays an important role in facilitating the audit committee in its financial reporting oversight role (Goodwin and Yeo, 2001; Goodwin, 2003). Given the current business environment, due importance has been given to the relationship between internal and external auditors (Gramling *et al*., 2004), considering its role as a "*detection and deterrent mechanism that moderates earnings management*" (Prawitt *et al*., 2009).

Abbott *et al*. (2012) and Pizzini *et al*. (2011) report evidence that external auditors' reliance on the internal audit function of the client helps increase audit efficiency, resulting in reduced audit delay.
Lin *et al*. (2011) further examine data from a study by Pizzini *et al*. (2011) and document that internal audit and external audit coordination leads to improved weakness disclosure.

Felix *et al*. (2001) and Prawitt *et al*. (2009) find a significant negative relationship between audit fees and high quality internal audit function, while Anderson *et al*. (1993) report an inverse relationship between internal audit budgets and external audit fees. Hay *et al*. (2008), Hay (2013) and Zain *et al*. (2015) also find a positive association between internal controls and audit fees. Prawitt *et al*. (2011) and Abbott *et al*. (2012) report that the time spent by the internal auditor in directly assisting external auditors reduces audit fees. Zain *et al*. (2015) extend the work of Felix *et al*. (2001) by showing that the reliance of external auditors on the internal auditor's work is contingent on the quality of the client's internal audit function.

There are two opposing views on the contribution of the internal audit to the external auditor. Studies that report a positive association between the internal audit and audit fees support the view that the internal audit and external audit play a complementary role in promoting a strong control environment within a company (Singh and Newby, 2010). Firms with effective corporate governance have a higher likelihood of engaging in greater levels of internal auditing and external auditing, or, in other words, this indicates their willingness to make more investment in achieving a high quality internal audit function, as well as pay for a higher quality external audit (Zain *et al*., 2015).

On the other hand, studies which find a negative association between the internal audit and audit fees support the argument that the internal audit, either partly or in full, could represent a substitute for the external audit (Singh and Newby, 2010). The substitutive mechanism takes place when the strong control environment safeguarded by the internal audit function leads to high reliance by the external auditor, contributes to lower assessment of audit risk, and causes the auditor to reduce his/her audit effort, thus, resulting in lower audit fees (Wallace, 1984; Felix *et al*., 2001; Zain *et al*., 2015).

There are a few possible explanations for why studies fail to find a significant relationship between the internal audit and audit fees: 1) there may be no underlying relationship between the internal audit and audit fees; 2) the proxy used to measure the internal audit is not strong enough; 3) the auditor may choose not to reduce their audit effort despite their reliance on the internal audit function; and 4) there may be a simultaneous negative and positive effect which offsets each other simultaneously (Singh and Newby, 2010).

A study by Davidson *et al*. (2005) in Australia is the first to examine the effect of the internal audit function on earnings management. Their study failed to find any evidence to suggest that the presence (versus absence) of the internal audit function within a company is associated with lower levels of earnings management. A more recent study by Prawit (2009) examined the same issue, but used a more sophisticated measure of internal audit quality based on a composite variable that captures multiple characteristics specified by external auditing standards as indicators of a high-quality internal audit function obtained from the Institute of Internal Auditor's unique GAIN data archive. Prawit (2009) examined the effect of internal audit quality on earnings management in the U.S. between 2000 and 2005. He reported evidence of a significant negative relationship between overall internal audit function quality with absolute abnormal accruals, negative abnormal accruals and likelihood to meet analysts' forecasts.

2.5.4 Characteristics of audit committee effectiveness

An audit committee is a sub-committee appointed by the board, and is responsible for the financial reporting oversight. The existence and effectiveness of the audit committee strengthens the control environment for the auditors which they rely on when conducting their audit (Muniandy, 2007; Krishnan, 2005). In the auditing process, the audit committee influence the selection of high quality auditors (Knapp, 1991; Abbott and Parker; 2000, Chen *et al*., 2005; Abbott and Parker, 2001), protect auditors' independence (Abbott *et al*. 2003b), and assess the appropriateness and adequacy of the audit plan (Dezoort and Salterio, 2001; Simunic and Stein, 1996). The U.K. Corporate Governance Code (2010: 19) requires the board to establish an audit committee comprised of at least three members who are independent non-executive directors, with at least one member having recent and relevant financial experience.

2.5.4.1 Audit committee size

The U.K. Corporate Governance Code (2010: 19) requires the establishment of an audit committee comprised of a minimum of three independent non-executive directors, or in the case of smaller companies, two independent non-executive directors. Previous research has reported that the average size of an audit committee is between three to four members (Xie *et al*., 2003; Abbott *et al*., 2004; Vafeas, 2005). A large size audit committee represents greater resources, talents, skills and knowledge to rely on in overseeing the financial reporting process (Norman *et al*., 2007; Lin and Hwang, 2010). Accordingly, the size of the audit committee is measured based on the number of directors in the committee (Abbott *et al*., 2004). A larger size audit committee contributes to diversity in terms of skills and knowledge for the committee monitoring process (Norman *et al*., 2007). Larger audit committees are also found to be more concerned about auditors' reputations, and prefer the Big Four as their auditors (Chen and Zhou, 2007). Too small of a size of an audit committee might result in problems with spreading assignments among members, whereas too large a size of an audit committee might be detrimental to the members' performance due to the possible problems in coordination and process, leading to poor monitoring (Jensen, 1993; Vafeas, 2005).

2.5.4.2 Audit committee independence

The U.K. Corporate Governance Code (2010:9) requires the board to establish an audit committee of at least three, or in case of smaller companies, two, independent non-executive directors. Literature suggests that audit committees that are independent preserve the objectivity of the internal and external auditors (Vicknair *et al*., 1993; Deli and Gillan, 2000; Abbott *et al*. 2003a), are more questionable of management actions (Baysinger and Butler, 1985), are more conservative and supportive of the proposed audit adjustment and auditor's effort (Dezoort *et al*., 2003), and reduce management threat to replace or dismiss the existing auditor when modified opinion is being issued (Carcello and Neal, 2003a; Hoitash and Hoitash, 2009; Knapp, 1985; Carcello and Neal, 2000). Audit committee independence is measured by the proportion of non-executive directors in the committee (Yang and Krishnan, 2005; Klein, 2002).

Besides this, audit committees with independent members are associated with a lower likelihood of internal control problems (Krishnan, 2005), fraudulent financial reporting (Beasley *et al*., 2000; Abbott *et al*., 2000), and earnings restatements (Abbott *et al*., 2004; Agrawal and Chadha, 2005). Abbott and Parker (2001) found that a fully independent audit committee that meets more than two times annually prefers Big 6 auditors in the event of auditor switches, while Abbott and Parker (2000) and Chen *et al*. (2005) reported that firms with higher proportion of independent non-executive directors in audit committees are more likely to select industry specialist auditors. The findings by Abbot and Parker (2001) and Chen *et al*. (2005) suggest that independent audit committees have a demand for higher audit quality.

2.5.4.3 Audit committee financial expertise

The U.K. Corporate Governance Code (2010:19) requires the audit committee to be comprised of at least one member who has recent and relevant financial experience. Audit committees which are comprised of financially expert members, especially ones equipped with auditing knowledge, have a higher likelihood of communicating detected material misstatements and correcting them in a timely manner (DeZoort and Salterio, 2001). This suggests that knowledge and experience in auditing and internal control improves the audit committee performance and judgements in their financial oversight role, allowing them to function in a similar capacity as an expert practicing auditor. Audit committee members with financial expertise in accounting are able to effectively assess the nature and appropriateness of accounting choices, constrain aggressive accounting policies and provide incentives to avoid the risk of litigation (Krishnan and Visvanathan, 2008).

Research on audit committee expertise reported that markets react positively to the appointment of audit committee members with financial expertise (Davidson *et al*., 2004). DeFond *et al.* (2005) assert that this positive reaction only occurs when the audit committee member has accounting-related expertise and only when the appointing firm has relatively strong corporate governance. This suggests that investors value audit committee accounting expertise more than its financial expertise (DeFond *et al*., 2005). Krishnan and Visvanathan (2008) documented that audit committees comprised of financially expert members are associated with increased levels of accounting conservatism. The findings of strong effects of audit committee financial expertise by Defond *et al*. (2005) and Krishnan and Visvanathan (2008) were concentrated on firms with effective functioning corporate boards. DeFond *et al*. (2005) and Krishnan and Visvanathan (2008) measured audit committee expertise in three ways: accounting financial experts (directors with experience as certified public accountants, controllers or chief finance officers), non-accounting financial experts (directors with experience as CEOs or presidents) and non-financial experts (directors who are neither accounting nor non-accounting financial experts). Other measurements of audit committee expertise used in previous research include SEC's definition of a financial expert (Abbott *et al*., 2004), audit partner experience (Naiker and Sharma, 2009), auditing expertise (Barua *et al*., 2010), and industry expertise (Cohen *et al*. 2010). These advances in the precision of audit committee expertise measures have deepened our understanding of audit committee effectiveness (Carcello *et al*., 2011) and indicate that the knowledge base of the audit committee members is of important consideration in determining its effectiveness in performing its financial reporting oversight role (Cohen *et al*., 2002).

In addition to the above-mentioned research, Carcello *et al*. (2006) document that companies with at least one financial expert in the audit committee (with an accounting background) are positively associated with subsequent common stock or debt issuance and institutional ownership, and negatively associated with having a Big Four auditor. Krishnan and Lee (2009) found that the presence of accounting expertise on the audit committee is positively related to litigation risk, but only in companies with stronger corporate governance, while Coates *et al*. (2007) reported that companies that improved their apparent audit committee financial literacy had higher stock returns than those that did not.

2.5.4.4 Audit committee activity

It is also important that the audit committee members allocate sufficient time to meet and discuss the performing of their monitoring role in the firm's financial reporting process (Lin and Hwang, 2010). Active audit committee that meet frequently are likely to be better informed and more diligent in performing their duties (Abbott *et al*. 2003a). Consistently, prior research has used the frequency of audit committee meetings as an indication of its diligence and level of activity (Peasnell *et al*., 2005; Yang and Krishnan, 2005). A study by Gendron *et al*. (2004) on audit committee meeting processes documented that audit committee members placed emphasis on financial statement accuracy, financial report wording, control effectiveness, and audit quality discussions in their meetings, and also sought to pose tough questions to management and the auditors. The audit committee members develop their sense of audit committee effectiveness by considering member backgrounds (independence and expertise), substantive and ceremonial features of audit committee meetings, and informal activities outside of audit committee meetings (Gendron and Bedard, 2006). Cohen *et al*. (2010) documented that audit committees in the post-SOX era are perceived to have more knowledge and authority, and to be more diligent and active.

Audit committees that frequently meet are associated with lower incidence of errors, irregularities and illegal acts (McMullen, 1996), lower likelihood to be sanctioned for fraud and aggressive accounting (Abbott *et al*., 2000; Beasley *et al*., 2000), and lesser prior period restatements (Abbott *et al*., 2004). Audit committees that meet frequently demand more assurance and audit effort from the auditor (larger audit scope and more testing performed), contributing to higher audit fees and higher audit quality (Krishnan and Visvanathan, 2009). Hence, it seems that inactive audit committees are unlikely to monitor management effectively (Menon and Williams, 1994). Active audit committees that meet frequently are likely to be better informed and more diligent in performing their duties (Abbott *et al*., 2003a). During the meeting, the audit committee members emphasise financial statement accuracy, control effectiveness and audit quality discussions, financial report wording, and questioning management and auditors on their actions/decisions (Gendron *et al*., 2004).

Nevertheless, the argument exists as to whether the number of audit committee meetings is a good indication of their activeness or diligence, as it does not reflect the quality of the discussion carried out by the audit committee members (Menon and Williams, 1994). Cohen *et al*. (2010) found evidence that audit committees in some companies are passive with respect to resolving disagreements between management and the auditor. Beasley *et al*. (2009) study of the post-SOX era found evidence of both substantive audit committee monitoring and ceremonial actions, with lack of consensus regarding the audit committee's oversight on financial statement fraud risk. Spira (1999) and Gendron *et al*. (2004) found that a great deal of audit committee activity occurs outside of formal meetings. This is further supported by a case study finding by Turley and Zaman (2007) on the U.K. listed companies which suggests that audit committees influence governance outcomes through informal meetings with the auditors, instead of raising complex and probing questions and opinions during the meeting itself.

2.5.5 The relationship between corporate governance and financial reporting quality

This study will examine empirically whether an effective board, audit committee and internal audit function limits the opportunistic earnings management practices of the client, which as a result also reduces the company's agency cost. Research to date provides mixed results on the relationship between the effectiveness of board, audit committee and internal audit function in promoting earnings quality. Positive findings in support of the effectiveness of corporate governance role in constraining earnings management are more prevalent in Anglo-American countries as compared to communitarian and developing countries (Gracia-Meca and Sanchez-Ballesta, 2009). The differences are driven by country-specific characteristics such as ownership concentration, legal system and level of investor protection (Millar *et al*., 2005) which are likely to influence the relationship between governance mechanisms and earnings management (Gracia-Meca and Sanchez-Ballesta, 2009).

Most of the extant research has focused on the U.S. market (Warfield *et al*., 1995; Dechow *et al*., 1996; Abbott *et al*., 2000; Bushee, 2001; Klein, 2002; Jiambalvo *et al*., 2002; Xie at al., 2003, Larcker and Richardson, 2004; Bédard *et al*., 2004; Abbott *et al*., 2004; Vafeas, 2005; Yang and Krishnan, 2005; Agrawal and Chadha, 2005; Ahmed and Duellman, 2007; Charitou *et al*., 2007; Krishnan and Visvanathan, 2008; Naiker and Sharma, 2009; Cheng and Reitenga, 2009; Dhaliwal *et al*., 2010; Gul *et al*., 2011). Xie at al. (2003) report that a more independent, diligent and financially expert board and audit committee contributes to lower levels of discretionary current accruals, but the audit committee size is found to have an insignificant effect on earnings management. Larcker and Richardson (2004) divide their samples into three clusters and report that for companies with strong governance (measured using their developed Corporate Governance Index), no relationship or a weak relationship exists between non-audit services and accruals quality. A statistically significant positive relationship is only found for companies that have weak corporate governance levels such as higher management ownership, lower institutional ownership, and a lower percentage of independent board members.

Klein (2002) reports negative association between discretionary accruals and audit committee independence when the proportion of independent members is 50 percent, but not 100 percent, suggesting that it is not necessary for the audit committee to be fully comprised of independent directors in order for it to effectively function. Bédard *et al*. (2004), though, document a significant decrease in the probability of aggressive earnings management when the audit committee is larger in size, fully independent, and comprised of financially expert members, but no association is found with audit committee meeting frequency. However, as their sample is selected from companies "*at the extremes of the abnormal accrual distribution*", the generalisability of their findings is limited.

Vafeas (2005) report that more "insiders" in the audit committee are associated with a higher likelihood that companies avoid earnings decline and negative earnings surprises, while small earnings increases are associated with companies with less frequent audit committee meetings. Using both Jones' (1991) total discretionary accruals model and Teoh *et al*. (1998) current discretionary accruals model, Yang and Krishnan (2005) document that the audit committee independence, financial expertise and frequency of meetings are not significantly associated with earnings management, whereas larger audit committee size and outside directorship is positively related to lower levels of earnings management.

Abbott *et al*. (2000) report that audit committees which are comprised of solely independent non-executive directors and which meet at least twice a year encounter fewer fraudulent financial statements. Abbott *et al*. (2004) report that audit committees with independent members that are active and have financial expertise reduce the likelihood of prior year earnings' restatements, but not audit committee size. Similarly, Agrawal and Chadha (2005) document that an independent and financially expert board and audit committee reduces the incidence of financial restatements.

A study by Naiker and Sharma (2009) reported that audit committee member experience as an audit firm partner (who is also affiliated with the incumbent audit firm) is negatively related to Kothari *et al*. (2005) performance-adjusted discretionary accruals. Dhaliwal *et al*. (2010), however, found that accruals quality is positively related to accounting expertise on the audit committee (when the accounting expert is independent, has fewer other board seats, and has lower tenure), especially when accounting expertise and finance expertise are both present. Their accruals quality is measured by the modified version of the Dechow and Dichev (2002) discretionary accruals model. Krishnan and Visvanathan (2008) found that accounting expertise (but not other expertise) on the audit committee is associated with greater conservatism, but only when overall corporate governance is strong. In a similar vein, using Korean data Choi *et al*. (2004) report that audit committee members with experience as academicians (Professors) or as employees in financial institutions reduces the occurrence of earnings management, but not audit committee independence.

Davidson *et al*. (2005) find that an independent board and audit committee are significantly negatively related to lower levels of earnings management. All these studies use the modified Jones (1991) discretionary accrual model. Benkel *et al*. (2006) also report a positive significant relationship between audit committee independence and earnings management using the discretionary accruals model developed by DeAngelo (1986). Piot and Janin (2007) document that the presence of an independent audit committee constrains earnings management practices in the French listed companies, using discretionary current accruals measured by Jeter and Shivakumar, (1999) and the Jones (1991) model.

Abdul Rahman and Ali (2006) found that earnings management tends to be smaller in companies with smaller board sizes but no significant association is found between audit committee size and independence with earnings management in Malaysia, using discretionary working capital accruals measured by the cross-sectional modified version of the modified Jones model by Dechow *et al.* (1995). However, in Indonesia, Siregar and Utama (2008) do not find any significant relationship between audit committee independence and earnings management using the discretionary accruals measured by the Jones (1991), Dechow *et al*. (1995), and Kasznik (1999) and Dechow and Dichev (2002) models. These three findings suggest that board and audit committee independence does not seem to be an effective mechanism in constraining earnings management practices in the developing countries, possibly due to the greater presence of controlling shareholders and cultural effects in those countries where the board members are less likely to question the management practices or decisions (García-Meca and Sánchez-Ballesta, 2009).

In the U.K., Peasnell *et al.* (2000a) reports that more outside directors on the board and larger board size are positively associated with lesser income-increasing accruals when the company earnings fall below the threshold. They based their analysis on the comparison between pre-managed earnings with earnings threshold (either zero earnings or reported earnings from last year) in both the pre and post Cadbury period. Peasnell *et al.* (2000b) extend the study and document evidence suggesting that the application of income-increasing accruals to meet earnings target have reduced in the post-Cadbury period due to the increased proportion of non-executive directors in the U.K. boards. However, they do not find any significant relationship between board size and earnings management in the U.K., during the pre-and post-Cadbury periods. Subsequently, in 2005, Peasnell *et al*. (2005) extended the previous U.K. studies using 1993 to 1996 data and found no significant evidence to suggest that board size, audit committee establishment, directors' stock ownership, blockholder (more than 10 percent shareholdings) and institutional ownership constrain discretionary accrual.

Based on past studies, it can be observed that very limited studies have been conducted in the U.K. examining the role of board and audits in constraining earnings management activities. Studies that have been conducted by Peasnell *et al*. (2000a, 2000b, 2005), Beekes *et al*. (2004), Ferguson *et al*. (2004) and Iqbal and Strong (2010) were carried out using data prior to the year 2000. Since then, many regulatory changes have been made to the U.K. corporate governance framework such as the continued revision to the U.K. Combined Code (2003; 2006; 2009) and the most recent issuance of the new U.K. Corporate Governance Code by the FRC in 2010 (subsequently improved in 2012 and 2014), taking into account lessons learned from the 2007/2008 global financial crisis. This raises the question whether the prior U.K. findings are still valid and calls for research using more recent data given the impact of the new governance reforms on the role played by boards and audit committees in enhancing the quality of financial reporting in U.K. public listed companies.

In addition, research on the effect of board diversity on earnings management is very limited. This is because board diversity is still a new phenomenon, and its contribution towards corporate governance effectiveness in the financial reporting process has yet to be extensively examined and proven. Hence, the PhD study fills the gap in the literature by examining the effect of female directors and foreign directors on boards simultaneously, in relation to the audit quality and earnings quality of the U.K. public listed companies.

While there are quite a few studies on the effect of internal audit function on audit quality, studies on the effect of internal audits on earnings quality are relatively scarce. Almost all of the past studies have been carried out in a U.S. setting. This begs an interesting question as to whether similar findings also apply to the U.K. given the different regulatory environment between the two countries.

Also, the majority of the corporate governance and earnings management studies mentioned above rely on the Jones (1991) and modified Jones model by Dechow *et al*. (1995) to measure discretionary accruals as the proxy for earnings management. This is due to the high explanatory power of these models despite their limitation. While most corporate governance studies tend to focus on a single proxy to measure earnings management (e.g. Klein, 2002; Xie *et al*., 2003; Bedard *et al*., 2004), more recent studies by Wang (2006) and Ye *et al*., (2010) adopt multiple approaches to measure earnings management in their analysis including discretionary accruals, cash flow predictions, earnings persistence, earnings informativeness, and persistence of transitory loss components.

Besides this, some studies have examined the function of board and audit committees separately (Abbott *et al*., 2000; Bedard *et al*., 2004), while some studies have combined the function of both board and audit committees together when examining their effect on financial reporting quality (Rahman and Ali, 2006; Klein, 2002; Peasnell *et al*., 2005). It is argued that consideration of the audit committee in isolation is questionable, as audit committee effectiveness is associated with board composition and "*a company's corporate governance can only be strengthened through joint efforts between these two parties*" (Cohen *et al*., 2002). Furthermore, the empowerment and selection of audit committee members are made by the board, suggesting that without strong support from the board, the audit committee cannot effectively fulfil its oversight functions (Cohen *et al*., 2004). Hence, this study suggests that the analysis of audit committee characteristics should not be segregated from the board of director characteristics by presenting them in different models, as this may not provide a complete analysis of the effectiveness of corporate governance in constraining earnings management.

2.6 Summary

Overall, the corporate governance and earnings management literature suggests that corporate governance mechanisms such as the board of directors, the audit committee and the company's internal audit function influence the credibility of financial statements by constraining earnings management practices. Similarly, industry specialist auditors, given their in depth industry knowledge and experience, are able to produce high quality audits, which limits the management manipulation of earnings. Research also shows that the product differentiation strategy adopted by the industry specialist auditor is valued by shareholders and investors as signalling high quality audits as they are able to command an audit fee premium relative to non-industry specialist auditors. The study views earnings management activities as an opportunistic behaviour by management, which is carried out in a legitimate way within the violation of GAAP for the purpose of concealing the true economic value of the company.

Overall, it can be seen that there is a very limited body of research examining the effectiveness of industry specialist auditors in constraining earnings management, particularly in light of the development of the various identified sources of auditor industry specialisation (e.g. using the national and city-level industry leadership framework, and the audit partner expertise as proxies for industry specialist auditors). Specifically, this issue still remains as an empirical question in the U.K. as it is yet to be tested. The only two studies in the U.K. that have employed the national and city-level industry leadership framework in their measures of auditor industry specialisation are by McMeeking *et al.* (2006) and Basioudis and Francis (2007). However, these two studies only examine the effect of auditor industry specialisation (using the national and city-level industry leadership framework) on audit fee premium, but not on audit quality and earnings management. Furthermore, there is a paucity of research with regards to the use of the individual audit partner as the unit of analysis, particularly in the U.K. The disclosure of the name of the senior statutory auditor (or engagement partner) signing off the auditor's report for and on behalf of the audit firm was only made mandatory in the U.K. for financial years beginning on or after 6 April 2008 (Section 503 of Companies Act 2006). This new rule makes it interesting to examine the effect of the individual audit partner within the context of the study. Thus, this study fills the gap in the literature and responds to the recent call from academics (DeFond and Francis, 2005; Carcello, 2005) and policy makers for more scrutiny and understanding of audit quality at the individual audit partner level.

A review of the governance literature reveals a scarcity of research in relation to board diversity. The effect of female directorship, foreign directorship and internal audit function on various measures of audit quality and earnings quality have yet to be thoroughly investigated, particularly in the U.K. Although the issues might have been examined in a different country, such findings may not apply to the U.K. given the different size of the capital markets, the cultural differences, the unique regulatory and economic environments, as well as the effectiveness of the governance mechanisms and investor protection.

Research on financial crises (e.g. the Asian crisis and the 2007/2008 financial crisis) has shown that the motivation for earnings management is higher during financial crisis periods due to the unstable economic and financial conditions (e.g. Charoenwong and Jiraporn, 2008; Lang and Maffett, 2011; Habib *et al.*, 2013). Consequently, various governance reforms have taken place following the 2007/2008 financial crisis (e.g. the implementation of the U.K. Stewardship Code and the Audit Firm Governance Code in 2010) with the aim to improve the quality of governance and auditing in the public listed companies, given that directors and auditors have been heavily criticised and blamed for a lack of necessary diligence, and so contributing to the crisis. Thus, the financial crisis setting makes it interesting to analyse the effect of industry specialist auditors and corporate governance on audit quality and earnings quality to see whether the findings would turn out differently as compared to prior studies carried out during the non-crisis period. Also, corporate governance research using more recent data is important, considering the changing financial reporting landscape and regulatory environment in the U.K. which has impacted the role played by corporate governance and external auditors recently.

CHAPTER 3
THEORETICAL FRAMEWORK

3.1 Introduction

The subject matter of this PhD thesis, which focuses on the issues related to auditor industry specialisation, corporate governance, audit quality and earnings quality, has been thoroughly discussed in the previous literature review chapter, where the gaps in the research literature have also been identified. This chapter describes the theoretical framework underpinning the current study from which the research questions and hypotheses are developed. As mentioned earlier, this PhD thesis examines two empirical research questions. The first empirical question is concerned with the effect of auditor industry specialisation and corporate governance structure on audit quality. The audit is taken in this study as a proxy capturing the variation in the level of audit effort as reflected in audit fees. The second empirical question examines the effectiveness of industry specialist auditors and firms' corporate governance structures in promoting earnings quality through constraining earnings management activities.

Before the empirical analysis is carried out, it is crucial to understand how a company's corporate governance characteristics and auditor competencies and specialisation could affect the quality of an audit and the company's quality of financial reporting. The first section below provides an explanation of the role of corporate governance and external auditing in financial reporting. The second section demonstrates theories of corporate governance. The third section specifically discusses the theories relating to auditor industry specialisation. The penultimate section provides the theoretical framework of this thesis which binds all the relevant aspects discussed in the earlier sections into a unique and coherent framework. The final section concludes this chapter.

3.2 The monitoring role of the board and audit committees

According to the U.K. Corporate Governance Code (2010, 2014, p.1), the board of directors' responsibilities include "*setting the company's strategic aims, providing the leadership to put them into effect, supervising the management of the business and reporting to shareholders on their stewardship*". This suggests that the board of directors plays a very strategic and tactical role in determining business success. Thus, it follows that it is very important that the board members have the appropriate balance of skills, experience, independence and knowledge of the company to enable them to discharge their respective duties and responsibilities effectively (U.K. Corporate Governance Code (2010, 2014). The U.K. Companies Act (2006) also outlines the board duties in ensuring transparency and fairness in a firm's financial reporting, where all accounts of the public listed companies that have been prepared and approved by the directors have to be independently audited by an external auditor to verify their credibility, objectivity and reliability.

In order to carry out its responsibility effectively, the board may, however, delegate its authority to sub-committees, such as the audit committee, nomination committee and remunerations committee. However, this delegation of authority does not make the board less accountable for the sub committees' actions. The audit committee is of particular interest in this study. This is because the audit committee has a direct link with the financial reporting process of a firm and represents a firm's liaison with the external auditors. The formation of the audit committee aims to enhance the integrity of the reported numbers, thus maintaining investors' confidence in the financial market (The Blue Ribbon Committee, 1999: p. 19). According to Wolnizer (1995), the audit committee responsibilities can be categorised into 1) accounting and financial reporting, 2) auditors and auditing, and 3) corporate governance. The successful implementation of these tasks also helps reduce management opportunistic behaviour, improve staff accountability, increase internal control effectiveness, enhance audit quality and strengthen the function of the board of directors while helping them to meet their legal responsibilities (Wolnizer, 1995).

Many researchers, particularly in Anglo-American settings, have examined the relationship between corporate governance and accounting or auditing outcomes. Amongst the studies are by Turley and Zaman (2004), Gramling *et al*. (2004), DeFond and Francis (2005), Cohen *et al*. (2007), Schneider *et al*. (2009), Garcýa-Meca and Sanchez-Ballesta (2009), Bedard and Gendron (2010), and Lin and Hwang (2010). Consistently, most of these meta-analyses studies have generally found evidence which supports the notion that an effective board and audit committee are associated with "*good*" accounting and auditing outcomes and more effective internal controls within the business environment (Carcello *et al*., 2011). The most popular characteristics of the board and audit committee that have been examined are their independence and expertise (Dechow *et al*., 1996; Beasley 1996; Abbott *et al*. 2004), whereas accounting outcomes are measured in terms of lower earnings management (e.g., Klein 2002), lower restatements (e.g., Abbott *et al*., 2004), or fraudulent financial reporting (e.g., Beasley 1996; Beasley *et al*., 2000). Auditing outcomes that have been examined include going concern reporting (e.g., Carcello and Neal 2000, 2003a), auditor type (e.g., Beasley and Petroni, 2001), and auditor fees (audit and non-audit fees) (e.g., Abbott *et al*., 2003; Carcello *et al*., 2002). The strength of internal controls have been measured by reference to SOX Section 404 internal control in the U.S., audit opinions, or management disclosures of internal control effectiveness under SOX section 302 in the U.S. (e.g., Zhang *et al*., 2007; Krishnan and Visvanathan 2007; Hoitash *et al*., 2009). Overall, research has demonstrated that the two roles of the board and audit committee are integral in the company financial reporting process in order to protect shareholders' interests and maintain investors' confidence in the financial markets.

3.2.1 The external auditor competencies through industry specialisation

In addition to the important role of a company's board of directors and audit committee, the external auditor also plays a crucial role in promoting financial reporting quality. Under the U.K. Companies Act (2006), the external auditors are appointed by the shareholders to form and express an opinion on whether the company's financial statements give a true and fair view of its financial position and comply with the applicable financial reporting framework. The external audit adds value and credibility to the financial reports prepared by the management (Power, 1996), through the auditor competencies and independent verification (DeAngelo, 1981). Regulators have also emphasised the importance of an auditor being able to understand the client's industry setting before proceeding with auditing work (Knechel *et al*., 2007). For example, ISA 315: Understanding the Entity and its Environment and Assessing the Risk of Material Misstatement states that an auditor needs to establish an understanding of the client's industry setting before planning their audit strategies. Consistently, empirical research provides evidence that independent and competent auditors provide higher audit quality.

DeAngelo (1981, p.186) defines audit quality as the "*market-assessed joint probability that a given auditor will both detect a breach in the client's accounting system, and report the breach*". DeFond and Zhang (2014) assert that audit quality is a component of financial reporting quality, because high audit quality increases the credibility of the financial reports. According to Watts and Zimmerman (1981), the supply of audit quality is affected by both the auditor's competency and incentives for independence. Auditor competency refers to the ability of the auditor to deliver high audit quality, which includes training, skills, and expertise (DeFond and Zhang, 2014). On the other hand, auditor independence is driven by market-based incentives such as litigation risk and concerns over reputational capital (Dye, 1993). Auditor competencies and auditor incentives are somehow interdependent. Greater incentives to supply high audit quality also motivate auditors to develop competencies that facilitate the delivery of high quality audits. Similarly, greater competency in delivering high quality audits is expected to increase the auditor's reputation capital, which consequently provides greater incentives to supply high audit quality (DeFond and Zhang, 2014).

Auditors are likely to specialise if they perceive benefits such as increased fees or market share from higher quality audits and/or economies of scale. Industry specialists are expected to provide higher audit quality due to having superior knowledge of the industry's business and accounting practices than non-specialists (Dopuch and Simunic, 1982). This suggests that specialists have greater competencies to deliver high quality audits. In addition to that, industry specialists have higher reputational capital at stake which continuously motivates them to deliver high audit quality.

Industry specialisation can arise at different organisational levels for different reasons. Global and national-level specialisation provides greater opportunities for knowledge sharing, while office-level specialisation leverages client-specific knowledge or local business conditions. On the other hand, partner-level specialisation may capture knowledge that is difficult to transfer while also providing stronger individual incentives. Prior literature measured specialisation based on the auditor with the largest industry market share or based on a certain arbitrary percentage of the market (usually 10 to 30 percent), which is calculated based on either sales, size, fees or number of clients (Ferguson *et al*., 2003; Neal and Riley, 2004; Francis *et al*., 2005; Reichelt and Wang, 2010). The Big N[4] auditors are usually the national-level specialists because they dominate most (if not all) industries. In addition, many studies control for brand name by restricting their analysis to Big N auditors only (Basioudis and Francis, 2007; Francis *et al*., 2005). Thus, industry specialisation often refers to specialisation among the Big N auditors.

The literature takes several approaches to test whether industry specialists provide higher quality audits. A large number of studies find that national-level specialists are associated with high audit quality proxies including discretionary accruals, ERC, going concern reporting, benchmark beating, disclosure quality, and analyst forecast accuracy (e.g. Balsam *et al*., 2003; Dunn and Mayhew, 2004; Behn *et al*., 2008; Lim and Tan, 2008; Payne, 2008), with relatively limited evidence that city level specialists provide higher quality (Reichelt and Wang, 2010, Sun and Liu, 2013). Prior studies in Taiwan documented that clients of partner industry specialists have lower financial restatements (Chin and Chi, 2009) and have a higher likelihood of receiving modified audit opinions (Chi and Chin, 2011). Another approach examines the market reaction to auditor switches and finds a positive reaction for switching to a specialist, which is consistent with the perception that specialists offer higher audit quality (Knechel *et al*., 2007).

While early studies find a fee premium charged only to larger clients, recent studies conclude that national-level industry leaders earn a fee premium, but only when they are also city-level industry leaders; global-level industry leaders earn fee premiums irrespective of whether they are also national-level specialists; and partner-level industry leaders earn a fee premium, but only when they also work for an audit firm specialist (for early studies, see Palmrose, 1986; Ettredge and Greenberg, 1990; O'Keefe *et al*., 1994; Pearson and Trompeter, 1994; Craswell *et al*., 1995; Deis and Giroux, 1996; Menon and Williams, 2001; for more recent studies, see Ferguson *et al*., 2003; Francis *et al*., 2005;

[4] The Big N audit firms started with the Big 8 comprised of Arthur Andersen, Coopers & Lybrand, Ernst & Whinney, Deloitte Haskins and Sells, Peat Marwick Mitchell, Price Waterhouse, Touche Ross and Arthur Young. But then the Big 8 became the Big 6 following the merger of Peat Marwick with the Klynveld Main Goerdeler (KMG) group in 1987 to become what was later known as KPMG, the merger of Ernst & Whinney with Arthur Young in 1989 to form Ernst & Young, and the merger of Deloitte, Haskins & Sells with Touche Ross to form Deloitte & Touche in August 1989. The Big 6 became the Big 5 in July 1998 with the merger of Price Waterhouse with Coopers & Lybrand to form PricewaterhouseCoopers, and finally after the collapse of Arthur Andersen in 2002 following the Enron financial scandal, the Big 5 became the Big 4.

Basioudis and Francis, 2007; Carson, 2009; Zerni, 2011; Goodwin and Wu, 2014; Nagy, 2014). Furthermore, another dimension is brought into the literature, namely the degree of audit market competition, and some recent evidence suggests that the degree of audit market competition impacts the specialisation premium. Numan and Willekens (2012) found that the specialisation premium increases with the distance between the auditor's market share and the market share of the next closest competitor, and Mayhew and Wilkins (2003) find similar results in the IPO market. This suggests that the fee premiums may accrue to auditors with superior bargaining power. But, in contrast, the fee premium declines when it is the clients that have the strong bargaining power (see Casterella *et al*., 2004; Huang *et al*., 2007; Fung *et al*., 2012). Additionally, auditors may alternatively grant fee discounts when specialisation produces economies of scale (DeFond *et al*., 2000). This last evidence was reported in Hong Kong and has not been replicated or found in another country so far.

The economic analysis of audit outcomes is important for two reasons. First, it demonstrates that auditing in general is valuable and has material economic consequences for the financial statement users. Second, outcomes provide evidence of the effects of differential audit quality. Audits are perceived to be of higher quality by debt and equity markets when companies are audited by large accounting firms or firms with industry expertise (Francis *et al*., 2011).

3.2.2 The interdependencies between a firm's internal corporate governance structure and external audit function

The board of directors, the audit committee and the internal audit function represent the internal monitoring mechanism within a company, whereas the external auditors serve as an external monitoring mechanism providing independent verification on the quality of a company's financial reporting. Interdependencies exist between a firm's internal corporate governance structure and the external audit function, and this is discussed in more detail below.

Looking at the accounting fraud landscape where 89 percent of the perpetrators are mainly the company's CEO or Chief Financial Officer (CFO) from top management (Beasley *et al*. 2010), the effectiveness of the board monitoring role needs to be carefully assessed by the external auditor to determine the strength of the control environment and to assess the audit risk (Carcello *et al*., 2011). Consistently, Bedard and Johnstone (2004) suggest that auditors take into consideration clients' strength of internal control, risk of earnings manipulation and effectiveness of corporate governance in making audit planning and pricing decisions, then adjust their audit effort and billing rates accordingly. Cohen *et al*. (2007) reported that auditors' control risk assessments and audit planning decisions are affected by the client's board characteristics and effectiveness. Stewart and Munro (2007) documented that the auditor risk assessment is lower in the presence of an active audit committee. This means that the auditor assesses risk to be higher and plans more audit hours for companies with weak governance (Carcello *et al*., 2011).

The relationship between the audit committee and the external auditor is manifested in its responsibility for overseeing the audit process and liaising between the external auditor and management. This includes making recommendations to the board on the appointment of the external auditor, discussing the level of audit fees, reviewing the audit engagement scope and activities, and protecting the auditor's independence (U.K. Corporate Governance Code, 2010; 2014). Auditor independence is protected by the audit committee controlling the type and amount of non-audit services purchased from the incumbent auditor, while ensuring that the proposed audit fees do not potentially jeopardise the quality of audit work (U.K. Corporate Governance Code, 2010; 2014). This is due to auditors trying to balance their audit costs with expected future losses as a consequence of legal liability arising from audit failure (Carcello *et al*., 2002).

The relationship between corporate governance and external audit can be explained using two competing theories, namely, the substitution theory and the signalling theory (Wu, 2012). The substitution theory posits that firms with effective corporate governance have lower agency costs, which contribute to lower audit risk and lower audit effort, thus lowering the audit fees charged by the auditor. In other words, effective corporate governance, to some degree, represents a substitute to the audit external auditor function. Studies by Tsui *et al*. (2001) provide support for this argument by showing that a corporate board independent of the CEO enhances financial reporting quality, and is positively associated with lower audit fees. In addition, Felix *et al*. (2001) and Prawitt *et al*. (2009) found evidence which indicated that external audit fees are lower in companies which employ higher-quality internal audit functions. On the other hand, the signalling theory argues that companies with an effective board and audit committee may signal to management and the auditor that they exercise a more effective monitoring role, and they are thus likely to be more demanding and to insist on having a higher quality audit (Carcello *et al*. 2002; Carcello *et al*. 2011). Consistent with this a study by Carcello *et al*. (2000) reported that a higher proportion of non-executive directors increase the demand for assurance and audit quality, leading to higher fees. Lee *et al*. (2004) document that companies with more independent audit committees prefer higher quality successor auditors. Bronson *et al*. (2009) reported that an external auditor is seldom likely to be dismissed following a going-concern report when the audit committee is fully independent. Wu (2012) asserts that the inconclusive results reported in prior studies make it difficult to ascertain which theory actually better explains the relationship between corporate governance and auditing.

To summarise, effective corporate governance and high quality audits are important and beneficial for investors and to the financial statement users in order to minimise the potential for damage to reputation and legal exposure while, at the same time, raising the support from shareholders. The next section reviews a number of theoretical perspectives for corporate governance research that are considered in this PhD thesis.

3.3 Theories on corporate governance

Although there is no agreed theoretical base for research in corporate governance (Parum, 2005), the study identified four main corporate governance theories that are relevant to the study in explaining the association between corporate governance, external audit function and audit (or earnings) quality. These are agency theory, stewardship theory, institutional theory and managerial hegemony theory. This chapter reviews these four theories and their relevance to the research questions of this study. These corporate governance theories either provide competing or complementary explanations to each other, as further discussed in the respective sections below.

3.3.1 Agency theory

Agency theory is a predominant theory in accounting and auditing literature underpinning the role of corporate governance and external auditing in improving financial reporting processes. Modern companies with widely dispersed ownership are characterised by their separation of ownership and control, where the shareholders (the principal) appoint managers (the agent) to run the daily operations of the business on their behalf. The distinction between ownership and control creates potential conflicts of interest between the two parties (Jensen and Meckling, 1976). Agency theory posits that managers are likely to act opportunistically by pursuing their personal gains (e.g. luxury company cars, lavish offices, excessive entertainment expenses) at the expense of maximising the shareholders' wealth (Jensen and Meckling, 1976; Fama and Jensen, 1983). Furthermore, the shareholders' inability to monitor management closely due to separation of ownership and control gives rise to information asymmetry which results in moral hazard (hidden actions by agents) and adverse selection problems (hidden information by agents), where both are being incurred at the expense of the shareholders' wealth (Fama, 1980). Earnings management can be referred to as a form of adverse selection problem, as it represents a misreporting of information by management (Singh and Davidson, 2003).

In order to reduce the conflict of interests, the shareholders incur some forms of agency costs which include a monitoring cost, a bonding cost and a residual loss (Jensen and Meckling, 1976). Monitoring cost relates to the appointment of internal as well as external monitoring mechanisms to constrain management opportunistic behaviour (Jensen and Meckling, 1976). Bonding cost relates to management compensation contracts, whereas the residual loss refers to the reduction in shareholders' wealth caused by any disparity between monitoring and bonding costs (i.e., in other words, when there is an imperfect alignment between the principal and agent interest) (Jensen and Meckling, 1976). As a form of monitoring cost, the corporate governance system reduces the agency costs through a number of mechanisms such as with the presence of the board of directors and the audit committee (Lin and Hwang, 2010; Gracia-Meca and Sanchez-Ballesta, 2009). Empirical research provides evidence that an effective board of directors and audit committee contributes to higher audit quality and "*good*" financial reporting outcomes (Carcello *et al*., 2011).

Another form of monitoring cost incurred by the shareholders is by engaging an independent external auditor to perform verification on the financial reports prepared by the management in respect of its truth and fairness in accordance with the applicable financial reporting standards (Lin and Hwang, 2010). Hence, an external audit enhances the credibility of the financial information provided to shareholders, reduces information asymmetry between the two parties and, therefore, limits management opportunistic behaviour such as earnings management (Lin and Hwang, 2010; Piot, 2001; Watts and Zimmerman, 1983). In order to signal to the market that they exercise a more effective monitoring role, companies with effective corporate governance characteristics are more likely to hire auditors that are perceived to deliver a high quality audit (Carcello *et al*., 2000; 2002; 2011). As noted earlier, high audit quality is defined by DeAngelo (1981) as the market assessed joint probability that an auditor will detect material misstatements and report them in the audit opinion. Thus, high audit quality refers to the auditors' competency and amount of effort devoted to the audit, as well as their objectivity and independence in reporting any identified breach in the client's accounting system (Watts and Zimmerman, 1986). The auditing literature shows positive association between the Big 4 industry leadership with various proxies of audit quality such as audit fees (e.g. Palmrose, 1986; Craswell and Taylor, 1995; Ferguson *et al*., 2003; Basioudis and Francis, 2007), auditor opinion reporting (e.g. Lim and Tan, 2008; Reichelt and Wang, 2010) and earnings management (e.g. Balsam *et al*., 2003; Choi *et al*., 2010).

In reality, the internal corporate governance mechanism (e.g. the board of directors, an audit committee, internal audit) and external corporate governance mechanism (external auditing) do not operate independently but interact with each other (Sharma *et al*., 2011) to have an impact on the quality of the financial reporting outcome. Furthermore, the auditor's monitoring role varies depending on the strength of the company's corporate governance structure (Larcker and Richardson, 2004). This argument is supported by evidence from auditor choice studies that the auditor differentiation strategy (industry specialisation) is valued by the board of directors, audit committee and shareholders as signalling a higher quality audit, as they are more likely to choose high quality auditors, either based on their brand name reputation or industry specialisation (Abbott and Parker, 2000; Beasley and Petroni, 2001; Velury *et al*., 2003; Kane and Velury, 2004; Lee *et al*., 2004; Chen *et al*., 2005).

Finally, agency theory is relevant to this study as it explains the opportunistic behaviour of management which is important for explaining the motives of earnings management. Besides this, agency theory also recognises the importance of the role of the board, the audit committee as internal monitoring mechanism, and the external auditors as external monitoring mechanism, in reducing the agency cost and promoting financial reporting quality. Thus, agency theory is supported if the study finding indicates that audit quality and earnings quality are higher when the company employs a Big 4 industry specialist auditor (either a firm, partner or combination of a firm and partner industry specialist) and has an effective board, audit committee and internal audit function.

3.3.2 Stewardship theory

In contrast to agency theory, stewardship theory proposes that the interests of the company management and the shareholders are in alignment (Albrecht *et al*. 2004). Management is assumed to be trustworthy and that their interests are properly aligned with the organisation and its owners. Thus, opportunistic behaviour such as earnings management would be unlikely to happen and there is no need for monitoring cost to be incurred.

Under the stewardship theory, management and executive directors represent the best people to enhance shareholders' wealth given their familiarity with the business environment and expertise in business operational activities. Thus, the role of the board is more seen as a support tool for the trustworthy executive directors, particularly the CEO, rather than as a control tool over management undertakings (Albrecht *et al*. 2004). Nevertheless, the shareholders' assumption that management is trustworthy might also open doors of opportunities for management to commit fraud or other misrepresentations (Albrecht *et al*. 2004). This may be due to the lack of management experience of board members (Choo and Tan, 2007) and may give ample space for management to exercise their desires and pursue their self-serving endeavour, as there might be times where management may not find their interests coincide with the shareholders.

Clark (2004) asserts that both agency theory and stewardship theory are important in explaining the behaviour of management, despite their opposing views (Muth and Donaldson, 1998). Ignoring the stewardship theory in the explanation of agency theory or one over the other does not sufficiently justify the cause of effect of board duality and performance. This is because management has to be controlled but at the same time enabled/empowered in order to perform effectively. Despite their contradiction, there are similarities between agency theory and stewardship theory in terms of motivation, identification, and use of power (Clark, 2004).

The stewardship theory is relevant to this thesis as it provides an alternative explanation for the positive effect of corporate governance in financial reporting. Thus, this theory is supported if the findings of the study indicate that the presence of a board, audit committee and internal audit function within the company contributes to higher audit quality and earnings quality.

3.3.3 Institutional theory

The institutional theory suggests that companies operate in an environment which pressures them to conform to certain rules and regulations to ensure their survival and legitimacy, as well as to allow access to the resources needed for their survival and sustainability (DiMaggio and Powell, 1983). Thus, companies shape themselves into appropriate structures following other companies in the same environment (Judge and Zeithaml, 1999), so as to avoid any disputes or investigations of their function by external parties (Meyer and Rowan, 1977). Such conformity and compliance to rules and regulations as well as the socially acceptable factors do not necessarily confirm that the company is indeed operating effectively in substance (Meyer and Rowan, 1977).

Under the institutional theory, corporate governance is viewed as a ritualistic role which the company needs to fulfil in order to legitimise its interactions with other players within the corporate governance mosaic (Cohen *et al*., 2007). In other words, the institutional theory suggests that board and management of companies tend to adopt best practices (such as the Code of Corporate Governance) and employ high quality auditors (e.g. Big 4 auditors and industry specialist auditors) in order to align the perception of their practices and characteristics with regulatory requirements and social expectations which, in turn, enhance their legitimacy. However, the adoption of such best practices does not necessarily mean that they are effectively functioning (Meyer and Rowan, 1977 and Meyer and Scott, 1983), as it could simply be ceremonial in nature to mimic other successful companies in their environment or in order to avoid regulatory sanctions or political pressures (DiMaggio and Powell, 1983).

This mimicking process is known as isomorphism, which could be further classified into coercive isomorphism, mimetic isomorphism and normative isomorphism (DiMaggio and Powell, 1983). Coercive isomorphism refers to compliance to political pressure and regulatory requirements to enhance the legitimacy of the corporations. In this study, coercive isomorphism could be related to a company's initiatives to comply with the stock exchange requirements and the recommended corporate governance best practices issued by the U.K. Financial Reporting Council. Mimetic isomorphism, on the other hand, is driven by internal motivation by the management from within the company itself (DiMaggio and Powell, 1983). For instance, the management decision to imitate another company's strategy that is foreseen to be successful and legitimised by society. In respect of financial reporting, mimetic isomorphism takes place when management decide to adopt the corporate governance structure or accounting practices of the successful or leading companies within their field, in order to become more competitive in the market. Over time, this will eventually lead to an increase in the overall compliance with the accounting standards and corporate governance best practices recommendations issued by the regulatory bodies. Finally, normative isomorphism is a mimicking process influenced by professionalism of involved individuals, or the professionals working in the organisation. The professionalism here refers to the practices or actions advocated by the professional bodies to their members (Burns, 2000). For example, the chartered accountants and the auditors are respectively governed by their professional bodies which continuously push for increased compliance with listing rules, accounting and auditing standards as well as corporate governance best practices.

In other words, the institutional theory asserts that a company's corporate governance processes will turn out to be closely comparable over time (Barreto and Baden-Fuller, 2006; DiMaggio and Powell, 1983) through their compliance with regulation and mimicking rival best practices, in order to enhance their legitimacy (Cohen *et al*. 2007). Kalbers and Fogarty (1998, p.131) describe this ceremonial effort as a symbolic display of organisational structures to demonstrate their conformity and social accountability. Institutional theory is able to explain the reason why there is a gap between the symbolic display of the organisation and its actual accomplishment. Fogarty and Roger (2005) assert that institutional theory explains the gap between a firm's actual accomplishments and its external structure on display.

This theory is relevant to this thesis as it provides explanation for why the adoption of the corporate governance best practices by companies does not have any significant effect on their financial reporting quality. This theory is supported if an insignificant relationship is reported between the corporate governance characteristics examined in this study with the proxy of audit quality and earnings quality.

3.3.4 Managerial hegemony theory

Managerial hegemony theory suggests that the board of directors play a passive role in decision making within the company as they are dominated by management. Moreover, their internal position as top management gives managers the advantage of obtaining strategic and confidential information about the business, which might not come to the non-executive director's attention. Thus, the board would be dependent on the management for information and insights about the firm and its industry for decision making purposes (Wolfson, 1984). In other words, the board only plays a "*rubber-stamp*" function within the company (Herman, 1981).

Managerial hegemony theory and institutional theory are similar in that the role of the board of directors is more ceremonial in nature in order to meet regulatory requirements. This is in contrast to agency theory and stewardship theory where the board is a substantive and effective monitoring mechanism over the opportunistic actions of management. The board's functions, according to managerial hegemony theory, are limited to ratifying management's actions, satisfying regulatory requirements, and enhancing senior management compensation (Molz, 1995; Core *et al*., 1999). As found by Nowak and McCabe (2003), outside non-executive directors have the perception that the CEO has control over the flow of information which influences the decisions and effectiveness of directors. The adverse implication of managerial hegemony is that independent directors within the board and audit committee will be dysfunctional as they are under management influence and will be unlikely to question management actions (e.g. during disputes with the external auditor).

Criticisms of this theory primarily highlight the lack of empirical support (Stiles and Taylor, 2001). Furthermore, the board has become more empowered since the 1980's (Kiel and Nicholson, 2003) through the separation of CEO and Chairman roles within a company and the increased composition of independent non-executive directors on the board. Thus, the board is no longer under the definitive control of management as they have the power to terminate the CEO whenever the duty of trust is breached (Mizruchi, 1983).

This theory is relevant to the thesis as it help explains the possible reason for an ineffective board or audit committee governance role. Insignificant results for the corporate governance effect on audit fees and earnings quality lend support to this theoretical justification.

3.4 Theories on auditor industry specialisation

An industry specialist auditor is expected to produce a higher quality audit due to their competency and in-depth knowledge of the client's business environment. Positioning themselves as a market leader in a particular industry (either at the firm-wide level, office level or audit partner level) allows the auditors to command a higher audit fee premium above and beyond the brand name premium alone enjoyed by the audit firms who are not industry leaders (Ferguson *et al*., 2003 in Australia; Basioudis and Francis, 2007 in the U.K.; Francis *et al*., 2005 in the U.S.). There are a number of theories in the literature that have been used to explain the demand and supply of industry specialist auditors in the audit market, and how the industry specialist auditor contributes to higher audit quality. In particular, the product differentiation theory, production efficiency theory, reputation theory and spatial competition theory are discussed in greater detail below. It is important to highlight that these theories may appear to be related to one another in explaining auditor industry specialisation.

3.4.1 Product differentiation theory

Mayhew and Wilkins (2003) and Casterella *et al*. (2004) applied the Porter (1985) five forces model to explain product differentiation from the supply perspective. Using the Porter (1985) model, they suggested that industry specialist auditors strive to obtain a competitive advantage over their rivals by offering differentiated products or services through channels such as economies of scale, brand name reputation, product differentiation, or combinations of these. Mayhew and Wilkins (2003) and Cahan *et al*. (2008) assert that the payoff for the investment is at its highest through servicing a homogenous group of clients within the same industry and is based on how successful the audit firm has differentiated itself from competitors. The degree of differentiation between the audit firm and its competitor plays an important role in determining the level of audit fees that the audit firm can charge as well as the bargaining power that the audit firm may have with its clients relative to its competitors.

An audit firm that possess significantly higher market shares than its industry competitors earns fee premiums, suggesting that audit firms that have successfully differentiated themselves retain a stronger bargaining position over their clients. Clients are also unlikely to switch to other audit firms because they cannot obtain similar quality services from competing audit firms (Mayhew and Wilkins, 2003). When the degree of differentiation is not obvious, the auditor loses its bargaining power with its clients, and the clients may also bargain for part of the cost savings by threatening to switch to another auditor which they perceive to be offering a similar quality of services. This would then result in market share driven price competition between audit firms with similar market shares in their effort to chase and obtain clients.

The market share dominance of an audit firm within a particular industry offers it two competitive advantages. Firstly, the high industry specific training costs could be spread over a larger client base, resulting in economies of scale which are not easily possible to be achieved by audit firms with a smaller market share. The benefit of economies of scale could be passed as savings to the clients either through an absence of a fee premium or as fee discounts charged by the industry specialist auditor (see Eichenseher and Danos, 1981; Danos and Eichenseher, 1982; Ettredge and Greenberg, 1990; Cairney and Young, 2006; Giroux and Jones, 2007). Secondly, audit firms with a large market share develop more industry-specific knowledge and expertise by focusing their resources and technologies in a particular industry, thus allowing them to deliver services of a higher quality relative to what can be offered by an audit firm with smaller market shares in the industry. Evidence of fee premium attached to successful differentiation strategy is widely available in the literature based on findings from different countries (Defond *et al*., 2000; Ferguson *et al*., 2003; Mayhew and Wilkins, 2003; Francis *et al*., 2005; Basioudis and Francis, 2007; Carson, 2009; Cahan *et al*., 2011; Fung *et al*., 2012). According to Willenborg (2002), these competing effects make it difficult to predict how audit fees will be related to industry specialisation.

The Porter's (1985) analysis of competitive forces is important and relevant for this study, as it helps to explain how an industry specialist is able to differentiate itself from competitors through market share, and predict the conditions under which the audit firm will earn fee premiums or offer fee discounts.

3.4.2 Production efficiency theory

Assuming perfect competition, studies generally deduce a positive association between industry specialisation and audit fees as the client is willing to pay for the auditor's expertise and reputation (e.g. Craswell *et al*., 1995; Ferguson *et al*., 2003; Mayhew and Wilkins, 2003; Francis *et al*., 2005; Numan and Willekens, 2012). This premium is further evidenced when higher audit quality is associated with industry specialisation (e.g., Balsam *et al*., 2003; Dunn and Mayhew, 2004; Reichelt and Wang, 2010). However, there is not always a direct relationship between fees and auditor specialisation because auditors in certain industries may experience economies of scale. When there are legitimate increases in efficiencies due to specialisation, firms benefit from technical economies of scale (Yardley *et al*., 1992). Differences and similarities in the auditor's client characteristics can affect audit production costs (e.g. on both labour and audit technology) (Brown, 2012). Several experimental studies found that industry specialisation is related to auditor efficiency; specialist auditors are found able to understand incomplete patterns that are descriptive of misstatements (Hammersley, 2006), have greater non-error knowledge (Solomon *et al*., 1999), identify more conceptual errors (Owhoso *et al*., 2002) and have better risk assessments (Low, 2004).

Since cost data for audit firms are not publicly available to analyse efficiency in an archival setting, prior archival studies investigated possible scale economies in the audit market by employing the survivorship approach and by examining audit fee behaviour[5] (Danos and Eichenseher, 1982; Yardley *et al.*, 1992). Studies using the survivorship approach provide evidence that high concentration allows audit market leaders to develop expertise-related economies of scale which over time allow the firm to gain a larger market share in certain industries (e.g., Eichenseher and Danos, 1981; Danos and Eichenseher, 1982, 1986; Hogan and Jeter, 1999). These empirical findings are in line with Doogar and Easley's (1998) model which predicted that auditors with smaller market shares have production constraints which make it difficult for them to compete with the large market share auditors. On the other hand, studies have examined audit fees based on Simunic's (1980) widely-used model in which fees are a function of direct production costs ("*effort*") and expected future losses that might arise as a consequence of an audit ("*risk*"). Previous literature has confirmed significant positive relationships between effort and risk factors with audit fees (Hay *et al*. 2006; Causholli *et al*. 2010). If a specialist

[5] The survivorship approach assumes that only cost-effective auditors will gain market share over time (Danos and Eichenseher, 1982; Yardley *et al*., 1992)

audit firm achieves economies of scale in the production of its services, then such production efficiencies could reasonably be expected to manifest as fee discounts.

A few archival studies find evidence of audit fee discounts for specialists in regulated industries that the authors attribute to economies of scale resulting from focused knowledge in these industries (e.g., Pearson and Trompeter, 1994; Fields *et al*., 2004). Using proprietary data in a Belgian setting, Fung *et al*. (2012) assert that economies of scale also benefit the audit firm in terms of more efficient resource allocation, knowledge sharing and intra-firm networking.

In general, client homogeneity within the same industry facilitates the transfer of industry-specific knowledge across clients, making it easier for auditors to spread the costs of acquiring industry expertise across their client base in a given industry, leading to potential economies of scale. Furthermore, less planning and oversight is required from the auditors and the auditor can benefit from the knowledge overlap from doing repetitive tasks, leading to more efficiency in terms of time and staffing and efficiencies from shared audit technology. Cairney and Young (2006) expand on previous studies by introducing a more general definition of industry homogeneity by using the operational cost structures of the industry in which the clients operate. Based on this premise, they report evidence that auditor industry specialisation and clients' industry homogeneity is positively related, as auditors prefer to audit new clients in similar industries. This demonstrates that industry specialist auditors compete on economies of scale as competitive advantage in a homogenous industry where they can effectively spread their cost and expertise through such homogeneity.

When auditors choose to specialise in homogenous industries due to economies of scale, it is reasonable to expect that industry specialists will be able to pass along cost savings in the form of lower audit fees to clients in these industries (Cahan *et al*., 2008). Even more cost efficiencies can be achieved when the industry specialist auditor operates in a homogenous industry with complex accounting practices. The high risk of material misstatements in the accounts leads to higher audit risk, which has to be compensated by the auditor by exerting more audit effort. Such response from the auditor would normally result in greater resource investment by the audit firm (e.g. longer working hours, more senior auditors, investment in audit technologies). This would then lead to higher audit fees and greater demand for industry specialist auditors for their expertise in handling industry specific accounting complexities (Bills *et al*., 2015). Given that the industry specialist auditor serves a larger proportion of the industry market, they could realize some cost savings with more homogenous operations and capitalise on their resource investments to address the high audit risk due to the specific industry accounting complexities of their clients. Consistently, results from studies by Bills *et al*. (2015) demonstrate that clients of industry specialists are being charged lower audit fees in industries with both complex accounting practices and homogenous operations. This finding is important as it indicates that a fee discount does not necessarily mean compromised audit quality, as it could simply be a manifestation of economies of scale that the auditor is passing on to clients, particularly to those clients with high bargaining power (Bills *et al*., 2015)

The production efficiency theory is relevant to this study as it provides an explanation for industry specialist auditors when there is an inconsistency between the effect on fee premium and audit quality. The theory explains the reason why an industry specialist auditor is still able to deliver a high quality audit despite the fee discount charged.

3.4.3 Reputation theory

Certain accounting firms willingly invest in higher levels of resources and expertise beyond the professional standards' minimum requirements, as an incentive to maintain their reputations as the producer of higher-quality audits. The costly investment by the Big 4 audit firms in building reputation through brand name recognition and industry expertise is worthwhile given the higher audit fees return (Craswell *et al*., 1995). Studies by Green (2008) offer evidence that an industry specialist auditor is more efficient and effective in performing analytical procedures whereas Moroney (2007) reports that the industry expertise of the auditor improves their efficiency in making audit judgments.

According to Scitovsky (1945) and Ferguson *et al*. (2003), market leadership is a mean to signal product quality which enables market leaders to charge higher prices or premiums to further signal their differentiated product quality. When product quality is uncertain, consumers infer product quality based on the supplier market share (Smallwood and Conlisk, 1979; Caminal and Vines, 1996). This is the case in auditing, where clients can only assess the service quality through experience (Craswell and Francis, 1999).

Lucrative prices charged for high quality experience goods symbolise market returns on sellers' reputations, and also can be seen as a control mechanism so that suppliers do not shirk on product quality (Shapiro, 1983). In the audit market, given that the Big 4 industry specialist auditors are able to extract a fee premium, this shows that their reputation as industry experts is valued and priced in the audit market above the Big 4 brand name reputation (Francis *et al*, 1999). From the demand side, clients' willingness to pay a fee premium to industry specialists indicates their commitment to higher quality financial reporting given that they are willing to hire expensive specialists to conduct the audit with superior reputations in the industry (Titman and Trueman, 1986). Furthermore, firms are more likely to choose industry specialist auditors to portray to public investors their concerns over agency issues (Mayhew and Wilkins, 2003). Studies on auditor industry specialisation infer industry leadership based on the audit firm's market share of clients' sales, total assets, audit fees or number of clients, as these measures represent an auditor's depth and breadth of knowledge, expertise, experience and investment in that particular industry (Neal and Riley, 2004; Basioudis and Francis, 2007; Francis *et al*., 2005).

This theory is relevant to this study. From the supply side, this theory provides explanation as to why auditors make reputation investments in certain industries while, on the demand side, this theory explains why clients are willing to pay higher audit fees (fee premium) to industry specialist auditors for their services.

3.4.4 Spatial competition theory

The theory of spatial competition found in the economics literature (Hotelling, 1929; Shapiro, 1989), which focuses on oligopoly market competition, suggests that price competition among suppliers only takes place in the market once firms have established their product entry and space decisions. Only those suppliers that have successfully differentiated their products may earn a price above the marginal cost in equilibrium without losing market share. The theory suggests that the product-space locations of the competitors also have an effect on the supplier's price elasticities. In other words, whether the supplier could charge a higher (lower) price would depend on how huge (small) is the distance of the competitor's product-space location in the market.

Prior studies on auditor industry specialisation (e.g. Craswell *et al*., 1995; Ferguson *et al*., 2003; Basioudis and Francis, 2007) have mostly relied upon the application of neoclassical theory by Simunic (1980). Simunic's theoretical work assumes that the audit market is perfectly competitive, and it shows how the fee premium earned by the industry specialist auditor is merely derived from a client's willingness to pay for a superior and differentiated service quality. However, Numan and Willekens (2012) assert that competition in the concentrated audit market is more accurately characterised as an oligopoly in nature, thus a more suitable theory is needed to recognise the supplier payoff interdependency. Numan and Willekens (2012) study is the first to apply the spatial competition theory of oligopoly to the audit market and propose an empirical method of analysis that could separate between the effects of competition and auditor industry specialisation on audit fees.

Applying the spatial competition theory by Hotelling (1929) to the audit market, Numan and Willekens (2012) assert that the industry specialisation strategy pursued by the audit firm contributes to greater market power relative to other rivals within the audit market. This will eventually put pressure on the specialist pricing, with the closest rival being the one who exerts the greatest pressure on price (Hotelling, 1929; Chan *et al*., 2004). However, this price competition can be softened by differentiation in terms of service quality provided by the industry specialist to the market. Whether the fee premium remains with the industry specialist auditor depends on how successfully they have managed to differentiate their services from their competitors, as clients will no longer be willing to pay a fee premium where substitute suppliers of similar service quality are available in the market. Nevertheless, the increased competition among the audit firms may offer the incumbent auditor incentives to distinguish him/herself from their closest competitor on other factors - it is then anticipated that this may result in higher quality audits (Numan and Willekens, 2012).

In their research, Numan and Willekens (2012) distinguish between two sources of market power: power arising from auditor-client alignment (measured by the close-fit between the auditor preference and the client's industry preference), and power arising from a firm's differentiation from its closest competitors (termed as competitive pressure from the closest competitor and measured based on the distance between the market share of the industry specialist auditor and their closest competitor in the audit market), in which both are assumed to have an effect on the fee premium charged by the auditor.

According to Numan and Willekens (2012), each of these sources of market power represents the effect of differentiation and competition, respectively, on audit fees. Consistently, the study of Numan and Willekens (2012) in the U.S. audit market documented that audit fees increase in both auditor-client industry alignment and industry market share distance to the closest competitor. They also found that the fee premium of the industry specialist auditor drops as the distance with the closest competitor becomes smaller. Consequently, the auditor effort might be reduced following the drop in the fee premium, and this, thus, may affect audit quality in a negative way. As the audit quality drops due to competition, clients' tendency to switch to similar quality auditor increases.

Subsequently, Numan and Willekens (2014) examined the effect of competitive pressure from close competitors on audit quality provided by the industry specialist auditor. They found that audit quality diminishes with increased competitive pressure from close competitors within the city-industry audit market. This is evidenced by lower likelihood of issuing a going concern opinion to a financially distressed company, higher discretionary accruals and higher likelihood of financial restatements as the market share distance with the close competitor becomes smaller. They also found that the market share dominance that an industry specialist auditor has over their closest competitor is the primary driver of audit quality, instead of industry leadership *per se*.

This theory is relevant to this study. This is because the spatial competition theory provides an explanation for how differentiation and competition can both have an effect on the fee premium and audit quality of the industry specialist. The application of this theory will be tested in the sensitivity analysis to justify whether the fee premium and earnings quality of the industry specialist is affected by competitive pressure from the closest competitor.

3.5 Summary

This chapter has discussed the relevance of various theories in corporate governance research and auditor industry specialisation in explaining the role of corporate governance and the industry specialist auditor in promoting financial reporting quality. As described by DeFond and Zhang (2014), financial reporting quality is affected by a company's earnings quality and audit quality.

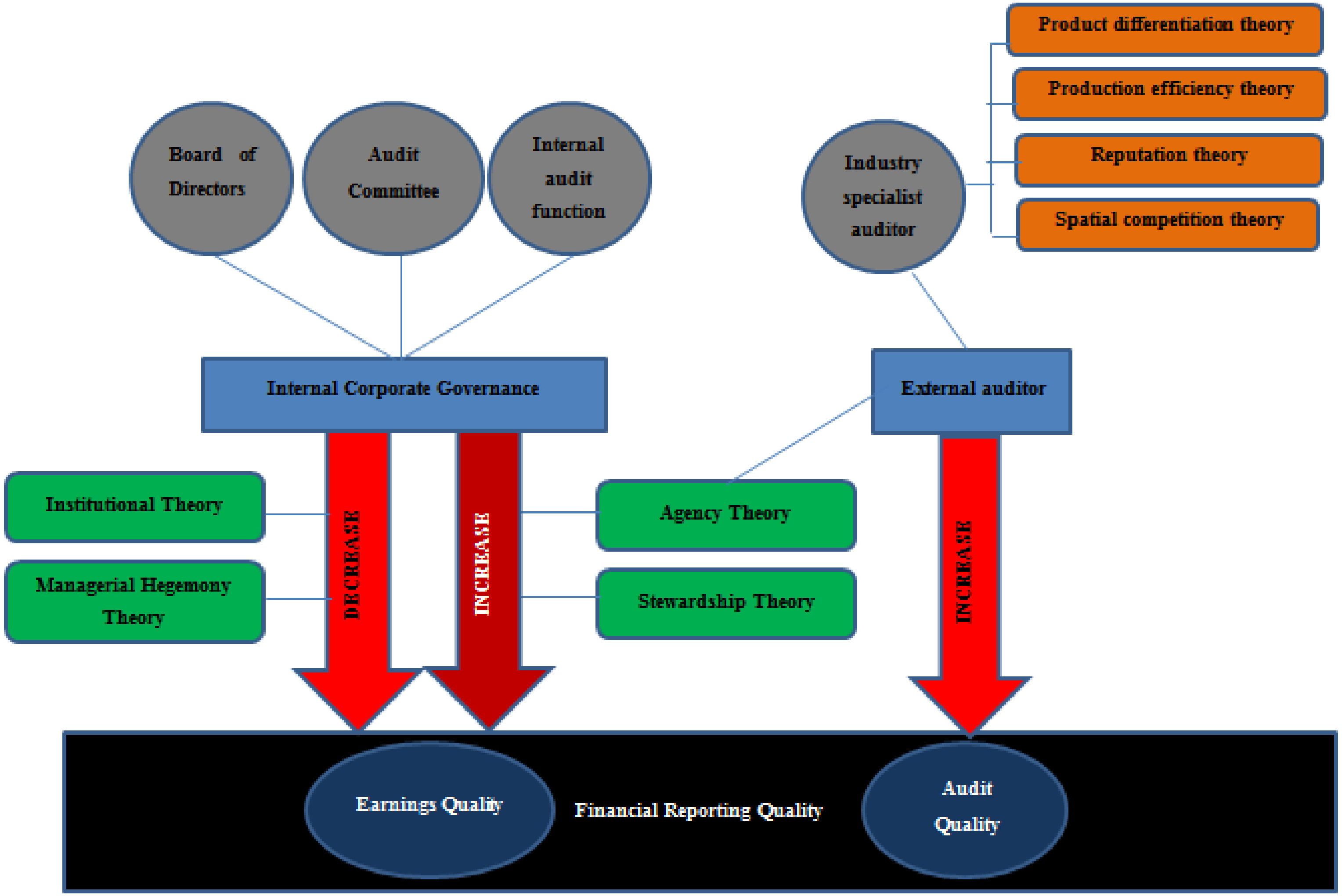
For corporate governance, agency theory, stewardship theory, institutional theory and managerial hegemony theory have been discussed. These theories provide significant insights on the efficiency and effectiveness of corporate governance monitoring and control functions from various perspectives (Hung, 1998). While agency theory focuses on conflicting interests between principals and agents, stewardship theory neglects the power of interest-based behaviour, which is important for explaining the motives of earnings management. However, there is a similarity between agency theory and stewardship theory where corporate governance is viewed as an effective monitoring mechanism to control management self-serving actions. Managerial hegemony theory, however, asserts that the board is dysfunctional and consistently supportive of management, and, hence, offers virtually no monitoring at all (Cohen *et al*., 2007; Beasley *et al*., 2009). To some extent, the managerial hegemony theory agrees with institutional theory in that the role of the board of directors is perceived only as ceremonial in nature. Nevertheless, the influence of agency theory in the literature has been instrumental in the development of corporate governance standards, principles and codes.

Mallin (2010) provided a comprehensive discussion of corporate governance theories and argued that the agency approach is the most suitable approach because it provides a more comprehensive explanation for corporate governance roles in the U.K. context which considers the complexity of the legal system, ownership, culture and other structural differences. Furthermore, the agency theory framework has the capacity to illustrate the drivers for earnings management as well as the expected relationship between corporate governance and external auditor monitoring mechanisms and earnings management. Researchers often find that audit committee members interviewed about governance processes provide responses that are consistent with a mix of governance theories (e.g., Beasley *et al*., 2009), as directors are balancing their monitoring roles under agency theory with other considerations, such as promoting legitimacy under institutional theory or being dominated by management under managerial hegemony theory (Carcello *et al*, 2011). Thus, all these four theories will be considered in the explanation of the findings of this study on the effect on corporate governance on audit fees (as a proxy of audit quality) and earnings quality.

With regards to auditor industry specialisation, the theories discussed have been product differentiation theory, production efficiency theory, reputation theory and spatial competition theory. These theories are able to provide distinct explanations of the demand and supply of industry specialist auditors, and how industry specialisation strategies could have differential effects on the auditor's fees and quality of services offered. Product differentiation theory explains the motivation for industry specialist auditors to meet client demands for a quality-differentiated audit in certain market segments of the audit market, by competing on the service rather than price alone. Production efficiency theory explains how the investment of resources and technology in a particular industry could result in economies of scale as auditors are able to spread their costs over huge client bases, while at the same time improve their knowledge and expertise in the domain industry. The reputation theory suggests that suppliers who hold a large market share are able to generate positive reputation effects and perceived value among buyers as market leadership signals product quality, which enables market leaders to charge higher prices. Firms with effective corporate governance which are concerned about agency issues normally select auditors that are costly, in order to signal to the public their financial reporting quality, given the auditor superior reputation. Finally, the spatial competition theory asserts that auditors derive some market power from industry specialisation. The two sources of market power arise from auditor-client alignment and from the market share distance with its closest competitors. These two sources of market power have an effect on the fee premium and audit quality offered by the industry specialist auditor.

Figure 3.1 below which summarises the theoretical framework used for the study, depicts the relationship between industry specialist auditors and a firm's internal corporate governance mechanism and financial reporting quality (which includes both earnings quality and audit quality).

Figure 3.1: Theoretical framework of the thesis



CHAPTER 4

HYPOTHESES DEVELOPMENT

4.1 Introduction

This chapter describes the development of the research hypotheses examined in the current study. The research hypotheses are developed based on the literature review and theoretical framework discussed in the previous two chapters. These hypotheses will then be used to examine the two main research questions underlying the two empirical analyses of the thesis. The first research question concerns the effect of industry specialist auditors and corporate governance on audit quality, where audit quality is measured by the variation in the level of audit fees; the second research question is concerned with the effect of industry specialist auditors and corporate governance on earnings quality. Earnings quality in this study is measured by the level of discretionary accruals, accrual estimation error and the likelihood of reporting a profit rather than a loss. The industry specialist auditor will be examined using various measurements under the firm national-city framework, partner national-city framework and joint firm-partner national-city framework analyses. The corporate governance characteristics that are of particular interest in this study are female directors, foreign directors, internal audit function, audit committee, audit committee independence, audit committee financial expertise and audit committee activity.

In order to investigate the abovementioned research questions, these two research questions are split into smaller hypotheses as discussed and presented below. The first section below describes the hypotheses development regarding the relationship between a firm's corporate governance characteristics with audit quality and earnings quality. Hypotheses will be developed for each of these corporate governance characteristics respectively in relation to audit quality and earnings quality. The second section further discusses the hypotheses development regarding the relationship between industry specialist auditors under the three different national-city frameworks with audit quality and earnings quality.

4.2 Female directors, audit quality and earnings quality

Female directorship is one of the core characteristics of corporate governance in the U.K., and it is believed that it contributes to better overall financial reporting quality. Thus, this section develops the arguments surrounding the first two hypotheses of the study which relate to female directorship, audit quality and earnings quality.

The U.K. Corporate Governance Code (2010, 2014) recommends that board members be appointed "*on merit, against objective criteria and with due regard for the benefits of diversity on the board, including gender*" (Principle B.2, p.11). Also, in 2010, the U.K. government commissioned Lord Davies to carry out an investigation identifying the reasons which precluded women from holding top executive positions in U.K. public listed companies.

Prior research pertaining to gender differences identified a few factors which differentiate the effectiveness of male and female workers in their board representations – these can be observed in terms of leadership style (Nielsen and Huse, 2010), behaviour and skills (Yukl, 2002) and greater demand for effective monitoring in order to protect their reputation in the capital markets (Gilson, 1990).

Thomas and Ely (1996) assert that the representation of female directors on boards brings more synergy to the board functionality, and the effect of such synergy is doubled as compared to when a new male board member is recruited, given the same level of qualification and capabilities. Several studies (Clarke, 2005; Huse and Solberg, 2006) have stressed that boards with female directors are more deliberate and thorough in their discussion and decision making, and are more likely to give due consideration to difficult issues that are normally taken for granted by all male boards. Joy (2008) highlighted that female directors' communication skills help facilitate more effective communication between the board and investors. Improvements in the board deliberation and communication are expected to contribute to better monitoring ability (Terjesen *et al*., 2009).

Female directors are reported to exercise greater diligence in their monitoring role, as evidenced by their higher participation in committees charged with governance and auditing and their ability to improve board attendance rate and CEO accountability (Adams and Ferreira, 2009). In terms of financial reporting outcome, prior studies have reported that the presence of female directors on board and audit committees reduces earnings management activities through accruals manipulation (Srinidhi *et al*., 2011). Gul *et al*. (2008) have documented that auditors exert higher levels of effort in auditing companies with female directors as compared to male directors given their high concern for audit and risk oversight and controls (Rosener, 2003). Female directors also contribute to increased disclosure and decreases in the cost of capital (Gul *et al*., 2010). Taken together, female participation on board and audit committees is viewed as contributing to better financial reporting quality and improved investor confidence in the quality of the reported earnings.

Nevertheless, there are also studies suggesting the negative effect of having female directors on boards, such as increased firm costs due to higher turnover and absenteeism (Cox and Blake, 1991), the notion that women are more risk-averse than men (Jianakoplos and Bernasek, 1998), and the increased likelihood of conflict when women are the minority gender representative (Richard *et al*., 2004). In other words, more gender diversity may not necessarily contribute to more effective monitoring as they are discriminated against and not given fair and equal say in their role relative to men (Carter *et al*., 2003).

On the other hand, prior research on other countries besides the U.S. has failed to find a significant relationship between the percentage of female members of U.S. boards and several accounting measures of financial performance. This includes studies from Sweden (Du Rietz and Henrekson, 2000), Denmark (Smith *et al*., 2006; Rose, 2007) as well as cross-country studies on over 500 of the largest firms from three Scandinavian countries, namely Denmark, Norway and Sweden (Randøy *et al*., 2006). These findings indicate that the effect of gender diversity between countries varies. Given the mixed findings from prior studies, the following hypotheses are proposed (stated in the null form):

H1: There is no significant relationship between the female directors on boards and audit quality.
H2: There is no significant relationship between female directors on boards and earnings quality.

4.3 Foreign directors, audit quality and earnings quality

The presence of foreign directors on boards improves board diversity, which is believed to contribute to better management quality and, thus, the quality of financial reporting. This section discusses the development of the next two hypotheses concerning the relationship between foreign directors, audit quality and earnings quality.

Ezat and El-Masry (2008) and Samaha *et al*. (2012) assert that the diversity of board nationalities within a company board bring together a multiplicity of ideas, experiences and perspectives. This may help to reduce the information asymmetry and the associated agency costs, expand cross-border flows of knowledge and technology, and improve financing prospects through the increasing pool of international investors (Fogel *et al*., 2013). Two studies by Carter *et al*. (2003) and Choi *et al*. (2007) have reported that a higher proportion of ethnic minority directors on boards contributes to better firm performance.

However, studies from diversity research (Konrad and Kramer, 2006; Ruigrok *et al*., 2007) have argued that diversity could also create problems in communication, such as conflict and misunderstandings, leading to slow decision making. A study by Masulis *et al*. (2012) has found that foreign directors are facing difficulties in challenging managerial decisions and evaluating managerial performance due to their unfamiliarity with national accounting rules, laws and regulations, governance standards, and management methods. They also found that foreign independent directors have higher rates of meeting absenteeism and poor performance and are associated with a greater likelihood of intentional financial misreporting, higher CEO compensation, and a lower sensitivity of CEO's turnover to performance. From the above discussion, the following null hypotheses are proposed:

H3: There is no significant relationship between foreign directors on boards and audit quality.
H4: There is no significant relationship between foreign directors on boards and earnings quality.

4.4 Internal audit function, audit quality and earnings quality

The internal auditing standards (International Auditing Standard ISA 610) explicitly recognise the potential relevance of internal auditing to the financial reporting process, which makes the internal audit an important function in promoting the quality of financial reporting. Thus, in this section, two hypotheses will be developed pertaining to the relationship between internal audit function, audit quality and earnings quality.

ISA 610 provides guidance on how the external auditor's reliance on the work of internal auditors could affect the nature, timing and extent of audit procedures performed by the external auditor. According to the Institute of Internal Auditors' (IIA) definition of internal audit, the internal audit's role encompasses both assurance activity as well as consulting activity, playing a key role in corporate governance and risk management, instead of narrowly focusing on evaluating and strengthening internal controls per se. Given the increased capability and scope of internal audits today, the presence of the internal audit function within a company facilitates the external audit process (Schneider, 2009) by reducing the risk of material misstatements (Prawitt *et al*., 2009; Lin *et al*., 2011) as well as improves internal governance processes (Munro and Stewart, 2010), particularly when agency costs are high (Adams, 1994).

The relationship between internal audit and audit fees could be explained using either the substitutive or complementary perspectives (Zain *et al*., 2015). Under the substitution perspective, it is argued that the external auditor can benefit from their reliance on internal auditor work, and thus pass some portion of the cost savings from reduced audit effort to the clients, resulting in lower audit fees (Prawitt *et al*., 2011). Findings from audit fee studies by Anderson *et al*. (1993), Felix *et al*. (2001), Prawitt *et al*. (2009), Prawitt *et al*. (2011), Abbott *et al*. (2012), Mohamed *et al*. (2012) and Zain *et al*. (2015) support this argument, as they report negative association between internal audit and audit fees. From a complementary perspective, it is argued that companies with strong corporate governance are committed to the establishment of an internal audit function within their companies and are willing to pay for higher audit fees to ensure that their demand for higher audit quality is met (Hay *et al*., 2008). Consistent with this argument, studies by Walker and Casterella (2000) and Goodwin-Stewart and

Kent (2006) and Hay *et al*. (2008) have found a positive relationship between presence of internal audit function and external audit fees.

A meta-analysis study by Bame-Aldred *et al*. (2013) reports that reliance on internal audit function can influence factors such as litigation risk, audit fees, audit efficiency, as well as the quality of the financial statement. Abbott *et al*. (2012) and Pizzini *et al*. (2011) have reported that internal audit function quality and its coordination with external auditors increases the external audit efficiency by reducing external audit delay, whereas Lin *et al*. (2011) find the coordination between the external auditor and the internal audit function improves audit quality as it increases material weakness disclosures. Prawitt *et al*. (2009b) document that internal audit function quality reduces the level of earnings management as measured by lower abnormal accruals and a higher propensity to meet or barely beat analysts' earnings forecasts. In light of the above discussion, the following hypotheses are proposed (in the null form):

H5: There is no significant relationship between the internal audit function and audit quality.
H6: There is no significant relationship between the internal audit function and earnings quality.

4.5 Audit committee size, audit quality and earnings quality

Audit committee size is an important attribute of good corporate governance as it contributes to the effectiveness of the committee's function, which affects the company's financial reporting quality. This section will discuss the two hypotheses pertaining to the relationship between audit committee size, audit quality and earnings quality.

The U.K. Corporate Governance Code (2010, 2014) requires the board to establish an audit committee comprised of at least three members. The suggestion of a minimum number of members on the audit committee, without an upper limit, expresses the regulatory bodies' view in the U.K. that they place great emphasis in ensuring the audit committees are sufficiently staffed.

A larger sized audit committee represents greater resources, talents, skills and knowledge to rely on in overseeing the financial reporting process (Vafeas, 2000; Bedard *et al*., 2004; Norman *et al*., 2007; Lin and Hwang, 2010), and thus it is argued a more effective monitoring is accomplished. Larger audit committees are more likely to withstand pressures of management collusion (Dezoort and Salterio, 2001) and are able to pay more attention to the overall financial accounting process (Anderson *et al*., 2004); other studies, however, conceive larger audit committees as increasing the risk of material misstatement (Boo and Sharma, 2008).

Results of studies on the effect of audit committee size on financial reporting outcomes are inconclusive. Prior studies (such as Abbott *et al*., 2003a; Vafeas and Waegelein, 2007; Hoitash and Hoitash, 2009; Zaman *et al*., 2011) have found a positive association between the audit committee size and audit fees. Few other studies report negative association between audit committee size and auditor independence (Hoitash and Hoitash, 2009), auditor switches (Archambeault and DeZoort, 2001), adverse ruling by the FRRP[6] (Song and Windram, 2004) and financial restatements (Lin *et al*., 2006), and lower accrual estimation error (Kent *et al*., 2010).

On the contrary, Abbott *et al*. (2004) and Bedard *et al*. (2004) report no significant relationship between audit committee size and earnings management. There are also studies which show no significant association between audit committee size and financial reporting measures such as audit fees (O'Sullivan, 1999), restatements (Abbott *et al*., 2004) and accruals (Baxter and Cotter, 2009). Given the mixed results from previous studies, the study makes no directional prediction, and the hypotheses are stated below in the null form, as follows:

H7: There is no significant relationship between the size of audit committees and audit quality.
H8: There is no significant relationship between the size of audit committees and earnings quality.

4.6 Audit committee independence, audit quality and earnings quality

The independence of the audit committee is another key characteristic for effective monitoring of the financial reporting process. In this section, two hypotheses pertaining to the effect of audit committee independence in relation to audit quality and earnings quality are developed.

It is assumed that independent directors within the audit committee are better at monitoring than their insider counterparts (DeFond and Francis, 2005) and are more likely to report questionable managerial financial reporting practices to appropriate authorities (Baxter and Cotter, 2009). The independence of the audit committee is also a subject of increasing regulatory interest. The U.K. Corporate Governance Code (2010, 2012, 2014) recommends, and the Sarbanes-Oxley Act (2002) requires all listed companies to establish and maintain a fully independent audit committee.

Based on prior literature, an audit committee that is independent preserves the objectivity of the internal and external auditors (Vicknair *et al*., 1993; Deli and Gillan, 2000; Abbott *et al*. 2003a), is more questionable of management actions (Baysinger and Butler, 1985), is more conservative and supportive of the proposed audit adjustment and auditor's effort (Dezoort *et al*., 2003; Abbott *et al*., 2003), and reduces management threat to replace or dismiss the existing auditor when modified

[6] In the U.K., action against companies by the Financial Reporting Review Panel (FRRP) for defective financial statements has been used as an equivalent signal to SEC Enforcement Actions in the U.S.

opinion is being issued (Knapp, 1985; Carcello and Neal, 2000; Carcello and Neal, 2003a; Abbott *et al*., 2003; Hoitash and Hoitash, 2009).

Studies in the U.S. by Carcello *et al*. (2002), Abbott *et al*. (2003), and Mitra *et al*. (2007) report a positive association between audit committee independence and audit fees. On the contrary, Zaman *et al*. (2011) have reported negative association between audit committee independence and audit fees in the U.K. Koh *et al*. (2007) and Kent *et al*. (2010) have suggested that higher audit committee independence is associated with higher accruals quality. Nevertheless, Osma and Noguer (2007) and Baxter and Cotter (2009) have failed to find any significant association between audit committee independence and absolute accruals. In light of the above discussion, the following null hypotheses are proposed:

H9: There is no significant relationship between audit committee independence and audit quality.
H10: There is no significant relationship between audit committee independence and earnings quality.

4.7 Audit committee financial expertise, audit quality and earnings quality

Audit committee financial expertise is a very important aspect of corporate governance, given the complex nature of financial reporting. This section will discuss the development of the next two hypotheses in respect of the relationship between audit committee financial expertise, audit quality and earnings quality.

In the U.S., the Sarbanes-Oxley Act (2002) mandates audit committees to include at least one financial expert and requires the rest of the members to be financially literate. In the U.K., the U.K. Corporate Governance Code (2010, 2014) recommends that "at least one member of the audit committee should have significant, recent and relevant financial experience". The SOX Act (2002) avoids a requirement for a qualification but demands an extensive list of accounting knowledge and skills.

Previous studies have measured audit committee financial expertise in several ways, such as accounting financial experts (directors with experience as a chief finance officer, a certified public accountant or a chartered accountant), non-accounting financial experts (directors with experience as Chairman or CEO) and non-financial experts (directors who are neither accounting nor non-accounting financial experts) (DeFond *et al*., 2005; Krishnan and Visvanathan, 2008). Other studies have measured audit committee financial expertise using the various U.S. Securities Exchange Commission's (SEC) definition of a financial expert such as audit partner experience (Naiker and Sharma, 2009), industry expertise (Cohen *et al*., 2010) and auditing expertise (Barua *et al*., 2010). Farber (2005), using SEC's broad definition of financial expertise, has reported that fraudulent firms have fewer financial experts on their audit committees. Similarly, Xie *et al*. (2003), Abbott *et al*.

(2003a), Bedard *et al*. (2004), Abbott *et al*. (2004), and Lo *et al*. (2010) note that the presence of financial expertise on the audit committee has a significant positive association with financial reporting quality measures. However, Carcello and Neal (2003a) and Zaman *et al*. (2011) do not report any benefit of such expertise. Krishnan (2005) and Dhaliwal *et al*. (2010) show that accounting financial expertise is associated with less earnings management. Similarly, Krishnan and Visvanathan (2008) provide evidence of a strong positive association between accounting financial expertise and earnings quality. Baxter and Cotter (2009) document a significant negative association between the audit committee accounting expertise variable (members with accounting qualification) and earnings management, hence improving financial reporting quality.

Audit committee members with auditing experience are reported to be more likely to communicate the detected material misstatements and make corrections in a timely manner (DeZoort and Salterio, 2001), while audit committee members with accounting expertise are more effective in assessing the nature and appropriateness of accounting choices and constrain aggressive accounting policies (Krishnan and Visvanathan, 2008). Vafeas and Waegelein (2007) argue that governance expertise is important in maintaining audit quality and have documented a positive and significant association between governance expertise and audit fee. They define audit committee governance expertise broadly as the audit committee members' experience of serving on another audit committee. It has also been argued that audit committee members with financial expertise can better handle financial reporting complexities relative to members without such expertise (Dezoort and Salterio, 2001; Davidson *et al*., 2004) and demand better monitoring of the financial reporting process (Engel *et al*., 2010). From the above discussion, the following hypotheses are proposed (in the null form):

H11: There is no significant relationship between audit committee financial expertise and audit quality.
H12: There is no significant relationship between audit committee financial expertise and earnings quality.

4.8 Audit committee activity, audit quality and earnings quality

Audit committee activity is an important corporate governance characteristic which contributes to effective financial reporting. Thus, this section develops the arguments for the two hypotheses of the study which relate to audit committee activity, audit quality and earnings quality.

Active audit committees that frequently meet are more attentive and have better understanding of their roles and responsibilities (Abbott *et al*., 2003a). During the meetings, audit committee members have the opportunity to put an emphasis on financial statement accuracy, control effectiveness and audit quality discussions, financial report wording, and questioning management and auditors on their actions/decisions (Gendron *et al*., 2004). Thus, how effective the audit committee is in discharging its roles and responsibilities can be measured based on its meeting activities (Song and Windram, 2004), as the frequency of audit committee meetings indicates its level of diligence and activity (Peasnell *et al*., 2005; Yang and Krishnan, 2005).

McMullen (1996) has found that incidence of errors, irregularities and illegal acts are lower in companies with active audit committees. Abbott *et al*. (2000) and Beasley *et al*. (2000) document that there is lower likelihood for companies to be sanctioned for fraud and aggressive accounting when the audit committee frequently meets. However, Abbott *et al*. (2004) have reported that financial restatements are unlikely to happen to companies that meet at least four times a year. Other prior studies (Vafeas, 2005; Goodwin-Stewart and Kent, 2006: Stewart and Munro, 2007; Krishnan and Visvanathan, 2007; Hoitash *et al*., 2009; Hoitash and Hoitash, 2009; Engel *et al*., 2010; Kent *et al*., 2010; Zaman *et al*., 2011) lend support to the importance currently attached to audit committee activity levels and highlight the benefits associated with higher levels of audit committee diligence. These studies have found support for higher audit committee meetings frequency in relation to audit fee, non-audit fee ratio and earnings quality. However, empirical studies such as Abbott *et al*. (2003a), Bedard *et al*. (2004) and Baxter and Cotter (2009) have found an insignificant association between a few financial reporting quality measures and audit committee meeting frequency. The results of a recent meta-analysis study by Lin and Hwang (2010) also support these findings by documenting a significant negative relationship between the number of audit committee meetings and earnings management. Given the mixed findings, the hypotheses below are stated in the null form as follows:

H13: There is no relationship between audit committee activity and audit quality.
H14: There is no relationship between audit committee activity and earnings quality.

4.9 Industry specialist auditors, audit quality and earnings quality

An industry specialist auditor is an important quality of a Big 4 auditor, given their depth of industry knowledge and expertise. This knowledge and industry expertise will help the auditor to perform better audit works and contribute to the quality of reported earnings. Thus, this section develops the arguments surrounding the first two hypotheses of the study which relate to industry specialist auditors, audit quality and earnings quality.

Auditor industry specialisation is a product differentiation strategy adopted by the audit firms to differentiate themselves from competitors in fulfilling clients' demands for better financial reporting quality (Krishnan, 2003; Dunn and Mayhew, 2004) and to compete on other than cost-price strategy alone (Habib, 2011; Gramling and Stone, 2001; Mayhew and Wilkins, 2003). By concentrating resource and technology investments in a particular focus industry or a number of industries, audit firms are able to gain efficiency through economies of scale (Eichenseher and Danos, 1981; Cairney and Young, 2006) and build reputation as an industry expert, which will then provide them with competitive advantage and greater market power (bargaining power) over their rivals, and the ability to charge a differentially high audit fee premium (Hay and Jeter, 2011), both over existing or potential clients (Causholli *et al*., 2010; Simony, 1980; Francis, 1984). The merger of the Big N accounting firms into the current Big 4 firms was partly driven by their intention to focus on industry specialisation (GAO, 2003), and the establishment of industry specialist status is seen as an important strategy in order for the audit firm to signal their ability to provide higher audit quality (FRC, 2009).

Many studies have reported a positive relationship between auditor industry (national) specialisation and audit fees (e.g., Defond *et al*., 2000; Ferguson *et al*., 2003; Mayhew and Wilkins, 2003; Francis *et al*., 2005; Carson, 2009; Cahan *et al*., 2011; Fung *et al*., 2012), and many others provide somewhat different conclusions. For example, Craswell *et al*. (1995) and Carson and Fargher (2007) find the fee premium to occur only in the large client segment, whilst Casterella *et al*. (2004) have reported the fee premium in the small client market. Other studies provide weak results or insignificant findings (e.g., Palmrose, 1986; Pearson and Trompeter, 1994; Ferguson and Stokes, 2002; Ferguson *et al*., 2006; Basioudis and Francis, 2007), inconclusive evidence (Minutti-Meza, 2013), or a fee discount (e.g., Ettredge and Greenberg, 1990; Hay and Jeter, 2011). The mixed results obtained are due to the different industry specialisation measures used, and to the country and the period analysed (Craswell *et al*., 1995; Ferguson and Stokes, 2002; Huang *et al*., 2007; Causholli *et al*., 2010; Hay and Jeter, 2011).

Relatively recent studies on auditor industry specialisation examine the effect of the Big 4 industry leadership on audit pricing using the national-city framework developed by Ferguson *et al*. (2003) to determine whether national (firm-level) reputations or city reputations (office-level) for industry expertise are more valued and more highly priced in the audit market (Ferguson *et al*. 2003; Francis *et al*., 2005; Basioudis and Francis, 2007; Hay and Jeter, 2011). Whether the audit pricing is dominated by firm-level or office-level industry expertise might explain the strength of knowledge sharing and transfer of industry expertise between the city-offices of the audit firms. The results of this line of research are so far inconclusive. In the U.S. and Australia, auditors' industry expertise based on joint national and city reputation matters more in the Big 4 audit market, as they are priced at a higher rate as compared to national industry leadership alone or city-specific industry leadership alone (Ferguson *et al*., 2003; Francis *et al*., 2005). On the contrary, the industry specialisation premium for city-industry leadership alone in New Zealand appears to be higher than joint national and city-specific industry leadership (Hay and Jeter, 2011). The prior U.K. evidence based on 2002 data (Basioudis and Francis, 2007) stands in contras to the U.S. and Australia, but is similar to New Zealand by showing that the Big 4 city-specific industry leadership alone matters more than joint national and city-specific industry leadership, as it is able to earn higher fee premiums. Also, no significant fee premium is reported for Big 4 national industry leaders in the U.K. relative to other Big 4 auditors that are not national industry leaders. The prior U.K. results imply that knowledge sharing and transfer in respect of industry expertise does not occur across the city-offices of the Big 4 firms. These findings of fee premiums are further supported by evidence showing that industry specialisation is associated with higher audit quality (e.g. Reichelt and Wang, 2010; Sun and Liu, 2013).

Nevertheless, more recently researchers have started focusing on partner industry expertise. This is based on the argument that audit partner depth of knowledge, experience and expertise dealing with clients within a specific industry is a somewhat unique "*private human capital'*" to the partner and cannot be easily shared[7] with other partners or staff residing within the same audit firm (Chi and Chin, 2011). Thus, this would mean that audit quality is not only attributed to the brand name of the audit firm, but is also affected by the individual partner's characteristics and reputation (Goodwin and Wu, 2014).

In their study in Australia, Goodwin and Wu (2014) have reported evidence of a premium only for companies audited by partners who are industry leaders at the city level, suggesting that partner level expertise is the driver of the audit fee premium for industry expertise. Their results are consistent when they control for either the first, second or third ranked city partner. On the other hand, Nagy (2014) has found evidence using U.S. data suggesting that there are fee premiums attached to both the city-industry leading audit partner and the audit firm who is a city-specific industry leader, and that the fee premium between the two aforementioned are not significantly different from one another. Zerni *et al*. (2011) also report a fee premium for partner industry specialisation in Sweden. Consistent with this, a study in Taiwan by Chin and Chi (2009) documented that the partner industry specialist reduces restatements. Chi and Chin (2011) document evidence of a combination of audit firm national industry leadership and partner city industry expertise contributing to higher earnings quality, resulting in lower discretionary accruals. As this study intends to examine the effect of industry specialist auditors on audit fees and earnings quality using the national-city framework at the firm and partner level, the following hypotheses are proposed (in the null form):

H15: There is no significant relationship between auditor industry leadership and audit quality.
H16: There is no significant relationship between auditor industry leadership and earnings quality.

[7] This is due to the difficulty in documentation or transfer of data/information (e.g. papers, databases), the involvement of professional judgment in various considerations, and the gap in knowledge-sharing through the use of IT-based expert knowledge systems (Vera-Munoz *et al*., 2006).

4.10 Summary

The table below summarises all the hypotheses that have been developed and are to be tested in the study.

H1	There is no significant relationship between female directors on boards and audit quality.
H2	There is no significant relationship between female directors on boards and earnings quality.
H3	There is no significant relationship between foreign directors on boards and audit quality.
H4	There is no significant relationship between foreign directors on boards and earnings quality.
H5	There is no significant relationship between the internal audit function and audit quality.
H6	There is no significant relationship between the internal audit function and earnings quality.
H7	There is no significant relationship between the size of audit committees and audit quality.
H8	There is no significant relationship between the size of audit committees and earnings quality.
H9	There is no significant relationship between audit committee independence and audit quality.
H10	There is no significant relationship between audit committee independence and earnings quality.
H11	There is no significant relationship between audit committee financial expertise and audit quality.
H12	There is no significant relationship between audit committee financial expertise and earnings quality.
H13	There is no relationship between audit committee activity and audit quality.
H14	There is no relationship between audit committee activity and earnings quality.
H15	There is no significant relationship between auditor industry leadership and audit quality.
H16	There is no significant relationship between auditor industry leadership and earnings quality.

CHAPTER 5
RESEARCH METHODOLOGY

5.1 Introduction

This chapter discusses the research methodology adopted to test the hypotheses developed. The first section provides justification on the research design adopted for the studies, while the second section provides explanation on the data collection process including the sample selection process. Next, the chapter outlines the definitions and measurements of the hypothesised variables (i.e. the industry specialist auditor and selected corporate governance variables examined in the study). The model specifications and related control variables are also discussed, followed by the data diagnostic test. The final section concludes.

5.2 Research methodology justification

The study adopts the positivism paradigm in examining its research problem. The positivism paradigm views the world as having a single reality and that the phenomenon being examined is context independent. Using the deductive approach to theory, the study relies on a number of corporate governance theories as well as a few theories on auditor industry specialisation to develop its research hypotheses. The corporate governance theories tested in the study are agency theory, stewardship theory, institutional theory and managerial hegemony theory. These theories are used to explain the relationship between firm's corporate governance characteristics, external audit and earnings quality. Whereas the auditor industry specialisation phenomenon is explained by product differentiation theory, production efficiency theory, reputation theory and spatial competition theory. These theories help explained the reasons why industry specialist auditors are able to earn either a fee premium or a fee discount, and provides differential audit quality due to their specialisation strategy.

The deductive approach to theory allows the test of theory against a large sample of observations, which increases the reliability and external validity of the research findings. The quantitative research design allows the researcher to make inferences and predictions of possible relationships among the variables analysed using mathematical modelling and statistical techniques, with strict variable definitions and measurements. Therefore, the research findings can be generalised and replicated across time and context. This quantitative research design fits well with the philosophical and theoretical underpinnings chosen for the research, which is the positivism paradigm. This decision is made after taking into consideration factors such as the resources availability in terms of time, data, funding, and the skill sets of the PhD student carrying out this research.

5.3 Data collection and sample selection

The research sample comprise of all the companies listed in the London Stock Exchange (LSE). It is a cross-sectional study over four-year period from 2008 to 2011. As mentioned earlier, there are two empirical studies being carried out in this thesis. The first study examines the relationships between industry specialist auditor and corporate governance on audit fees. The second empirical analysis examines the relationship between industry specialist auditor, corporate governance and earnings quality. The investigation for both empirical studies is performed under three different level of analysis for auditor industry specialisation: 1) firm national-city framework, 2) partner national-city framework, and 3) joint firm-partner national-city framework. Thus, each of this empirical study is carried out using different sample size based on data availability for each level of analysis. While the firm national-city framework analysis is based on 2008 to 2011 sample of observations, the partner national-city framework and the joint firm-partner national-city framework sample are limited to only three years 2009-2011 data. This is because the disclosure of the name of the senior statutory auditor (or engagement partner) signing the auditor's report for and on behalf of the audit firm was only made mandatory for financial years beginning or after 6 April 2008 (Section 503 of the Companies Act 2006) and, therefore, the first full disclosure of this requirement has happened in the 2009 year. Without such disclosure, it would not be possible to carry out the partner level of analysis.

The initial sample of companies listed on the LSE between year 2008 to 2011 comprises of approximately 9,946 observations. This sample is then reduced further to exclude listed companies from the financial services sector, governmental institutions, as well as companies with missing data for the audit pricing and earnings quality analyses. Following Basioudis and Francis (2007), sample with less than two observations per city-industry combination are also eliminated, as to allow for the application of the national-city framework for the auditor industry specialisation analysis. Nevertheless, it is important to note that the calculation of market share in determining auditor industry leadership at the national level is based on the sample of all companies (N=1,747) with available audit fees data. The sampling procedure is shown in Table 5.1 and Table 5.2 below, for the audit pricing and earnings quality analyses separately. The industry classification used in this study is based on the FAME categorisation of major industry sectors, where the numerous LSE industry codes (SIC codes) of similar industry nature are being categorised into only 13 major industry sectors. This is the first study on auditor industry leadership and corporate governance in the U.K. that employ data from the period affected by the 2007/2008 financial crisis, and, therefore, any conclusions need to be reached with this consideration in mind.

For the audit pricing analysis, the study only used the Big 4 sample to mitigate the problem of self-selection bias and to control for the Big 4 brand name reputation (Craswell *et al*., 1995; Chung and Kallapur, 2003). This is because the study is interested to determine whether there is any differential fee premium gain by the Big 4 industry specialists relative to Big 4 non-industry specialists. Similar approach has been used in prior studies by Basioudis and Francis (2007) and Francis *et al*. (2005). Nevertheless, robustness analysis using the full sample including both the Big 4 and non-Big 4 clients are also performed in Chapter 8. Table 5.1 summarises the selection procedure for the first empirical study examining the relationships between industry specialist auditor, corporate governance and audit fees.

Table 5.1: Sample selection procedures for the first empirical study: The relationship between industry specialist auditors, corporate governance and audit quality

Description	**2008**	**2009**	**2010**	**2011**	**Pooled**
All LSE listed firms	2,724	2,414	2,289	2,519	9,946
Less: Firms not followed by FAME database	(1,706)	(1,380)	(1,229)	(1,456)	(5,771)
Less: Financial firms	(112)	(117)	(121)	(120)	(470)
Less: Public administration and defence, health and education, other services firms	(401)	(415)	(437)	(441)	(1,694)
Less: Firms with incomplete financial data	(27)	(7)	(10)	(10)	(54)
Less: Firms audited by other than U.K. audit offices	(10)	(7)	(8)	(8)	(33)
Less: Firms with unavailable annual reports	(56)	(66)	(35)	(20)	(177)
Full sample with complete data on audit fees *This sample is used to calculate the industry specialist auditor market share in Table 6.4*	**412**	**422**	**449**	**464**	**1,747**
Less: Sample with less than two observations per city-industry combination	(67)	(71)	(75)	(70)	(283)
Less: Firms with missing corporate governance data	(15)	(22)	(13)	(38)	(88)
Less: Non-Big 4 sample	(118)	(114)	(130)	(124)	(486)
Final sample for firm national-city framework	**212**	**212**	**232**	**236**	**892**
Less: Sample with missing audit partner data	(212)	-	-	-	212
Final sample for partner and joint firm-partner national-city framework	**-**	**212**	**232**	**236**	**680**

The second empirical analysis examines the relationship between industry specialist auditor, corporate governance and earnings quality. There are three earnings quality proxies examined in this study; 1) the discretionary accruals which controls for firm's performance based on Kothari *et al*. (2005) model (*DAC_PERF*), 2) the accrual estimation error (*AEE*) based on the Dechow and Dichev's modified accrual quality model of McNichols (2002), and 3) the likelihood of reporting a profit (avoiding a loss) model adopted from Francis *et al*. (2013) (*PROFIT*). Similar to the audit pricing analyses, the earnings quality analyses is also performed under the three different level of analysis for auditor industry specialisation: 1) the firm national-city framework, 2) the partner national-city framework, and 3) the joint firm-partner national-city framework. Thus the sample size varies. Table 5.2 summarises the selection procedure for the second empirical study examining the relationships between industry specialist auditor, corporate governance and earnings quality. For the *DAC_PERF* and *AEE* analysis, consistent with the arguments set forth by DeFond and Jiambalvo (1994) and Subramanyam (1996), the sample for each industry within a year comprised of at least six observations, in order to provide an unbiased estimation of discretionary accruals.

Table 5.2 below summarises the selection procedure and data attrition for the second empirical study examining the relationships between industry specialist auditor, corporate governance and earnings quality. Based on the Table 5.2 below, the final sample using the firm national-city framework is 1,347 observations for the *DAC_PERF* and *PROFIT* models and 1,083 observations for the *AEE* model for the 2008-2011 period. Similarly, the final sample using the partner national-city framework and the joint firm-partner national-city framework is 1,019 observations for both the *DAC_PERF* and *PROFIT* models and 824 observations for the *AEE* model for the same period as above. These different size samples will be used consistently in all the earnings quality empirical analyses and robustness tests performed. The analysis of earnings quality is based on the full sample instead of the Big 4 sample only, while controlling for the Big 4 effect using a dummy variable.

Table 5.3 presents the distribution of sample based on the 13 major sectors for the first empirical study. While Table 5.4 presents distribution of sample based on the 13 major sectors for the second empirical study.

Table 5.2: Sample selection procedures for the second empirical study: The relationship between industry specialist auditors, corporate governance and earnings quality

Panel A: Discretionary accruals and likelihood to report a profit (avoid a loss) analyses					
Description	**2008**	**2009**	**2010**	**2011**	**Pooled**
All LSE listed firms	2,724	2,414	2,289	2,519	9,946
Less: Firms not followed by FAME database	(1,706)	(1,380)	(1,229)	(1,456)	(5,771)
Less: Financial firms	(112)	(117)	(121)	(120)	(470)
Less: Public administration and defence, health and education, other services firms	(401)	(415)	(437)	(441)	(1,694)
Less: Firms with incomplete financial data	(27)	(7)	(10)	(10)	(54)
Less: Firms audited by other than U.K. audit offices	(10)	(7)	(8)	(8)	(33)
Less: Firms with unavailable annual reports	(53)	(66)	(35)	(20)	(174)
Less: Firms with missing corporate governance data	(15)	(22)	(13)	(38)	(88)
Less: Sample with less than two observations per city-industry combination	(67)	(71)	(75)	(70)	(283)
Less: Firms with incomplete data to calculate *DAC_PERF*	(5)	(8)	(9)	(10)	(32)
Final sample for firm national-city framework	328	321	352	346	1,347
Less: Sample with missing audit partner data	(328)	-	-	-	(328)
Final sample for partner and joint firm-partner national-city framework	**-**	321	352	346	1,019
Panel B: Accrual estimation error analysis					
Description	**2008**	**2009**	**2010**	**2011**	**Pooled**
Final sample for firm national-city framework from Panel A	328	321	352	346	1,347
Less: Firms with incomplete data to calculate *AEE*	(69)	(56)	(54)	(85)	(264)
Final sample for firm national-city framework	259	265	298	261	1,083
Less: Sample with missing audit partner data	(259)	-	-	-	(259)
Final sample for partner and joint firm-partner national-city framework analyses	**-**	265	298	261	824

Table 5.3: Sample size and industry distribution for the first empirical study: The relationship between industry specialist auditors, corporate governance and audit quality using the final sample under the firm national-city framework

Panel A: Distribution of sample firms by year										
Year	**2008**		**2009**		**2010**		**2011**		**Pooled**	
Sample size	N	%	N	%	N	%	N	%	N	%
	212	23.77	212	23.77	232	26.00	236	26.46	892	100.00

Panel B: Distribution of sample firms by industry			
Major Industry Sectors	**2 Digit SIC Codes**	**Pooled**	
		N	**%**
Primary Sector (agriculture, mining, etc.)	1,10-14,23	85	9.53
Chemicals, rubber, plastics, non-metallic products	24-26	125	14.01
Construction	45	46	5.16
Food, beverages, tobacco	15-16	48	5.38
Gas, water, electricity	40-41	17	1.91
Hotels and restaurants	55	51	5.72
Machinery, equipment, furniture, recycling	30,33-37	133	14.91
Metals and metal products	27-29	68	7.62
Post and telecommunications	64	47	5.27
Publishing, printing wood, cork, paper,	20-22	34	3.81
Textiles, wearing apparel, Leather	17-19	17	1.91
Transport	60-63	58	6.50
Wholesale and retail trade	50-52	163	18.27
Total		892	100.00

Table 5.4: Sample size and industry distribution for the second empirical study: The relationship between industry specialist auditors, corporate governance and earnings quality using the final sample under the firm national-city framework

Panel A: Distribution of sample firms by year										
Year	**2008**		**2009**		**2010**		**2011**		**Pooled**	
Sample size	N	%	N	%	N	%	N	%	N	%
	328	24.4	321	23.8	352	26.1	346	25.7	1,347	100.00

Panel B: Distribution of sample firms by industry			
Major Industry Sectors	**2 Digit SIC Codes**	**Pooled**	
		N	**%**
Primary Sector (agriculture, mining, etc.)	1,10-14,23	151	11.22
Chemicals, rubber, plastics, non-metallic products	24-26	191	14.18
Construction	45	52	3.86
Food, beverages, tobacco	15-16	65	4.82
Gas, water, electricity	40-41	32	2.37
Hotels and restaurants	55	66	4.90
Machinery, equipment, furniture, recycling	30,33-37	234	17.38
Metals and metal products	27-29	148	10.99
Post and telecommunications	64	72	5.34
Publishing, printing wood, cork, paper,	20-22	43	3.19
Textiles, wearing apparel, Leather	17-19	23	1.71
Transport	60-63	69	5.12
Wholesale and retail trade	50-52	201	14.92
Total		1,347	100.00

5.4 Sources of data

This study employs a quantitative research design through analysis of publicly available secondary data. There are four main sources of data relevant to the study, namely Datastream, FAME, Thomson One Banker and the firms' annual reports. Financial data for the audit pricing and earnings quality analysis are downloaded from Datastream, FAME and Thomson OneBanker databases. Data on the audit partners, audit engagement office, the board of directors, the audit committee characteristics, and the internal audit function are hand collected manually from the annual report of each company in the sample from year 2008 to 2011, as they are not available in any database. The annual reports are either downloaded from the individual company's website or Northcote database[8]. Substantial amount of time and effort have been devoted to the manual data collection process. The individual director bibliography is checked to identify the director's nationality and gender, which are later cross-checked to the Directors information in the FAME database for verification and completeness. The audit committee characteristics (such as audit committee size, independence, frequency of meetings and type of expertise possessed (accounting, finance and supervisory expertise based on their education background, professional qualification held as well as working experience), are extracted manually from the corporate governance section With regards to the industry specialist auditor analysis, the information on the auditor city offices and the name of the individual audit partner are extracted manually from the individual auditor report from the company's annual report. The various financial statement data items used to calculate the audit quality and earnings quality variables are explained in the next section. Before that, the empirical models used in the analyses are explained below.

5.5 Definition and measurement of hypothesised variables

The variables of interest examined in this study are explained in this section. There are main variables to be examined are the different specification for industry specialist auditor, the characteristics of the board and audit committee, and the presence of internal audit function.

5.5.1 Industry specialist auditor

Prior auditor industry specialisation studies (Neal and Riley, 2004; Basioudis and Francis, 2007; Francis *et al*., 2005), consider industry specialist to be those auditors with the largest market share (or based on certain arbitrary percentage of market share) within a particular industry. This is based on the contention that audit firm with the largest market share has developed the largest knowledge base within that particular industry, which later may benefit them in terms of increased economies of scale and improved audit quality (Neal and Riley, 2004). Various different approach has been used to measure auditor industry specialist, either based on the number of clients audited, the fees that clients

[8] Northcote is a free online research tool which provides links you listed company information. The website URL is http://www.northcote.co.uk/.ze

pay to the auditor for statutory audit, the assets of clients, or the sales of clients. Following prior study by Basioudis and Francis (2007), this study measures the auditor industry market share based on audit fees, based on the notion that it is the most popular and appropriate measure of industry leadership as audit fees "*measure the value of the auditing industry's economic output*" (Basioudis and Francis, 2007)[9]. Furthermore, the use of other measures could create potential problem and inconsistency in the analyses. Prior U.K. study by Basioudis and Francis (2007) report that designating an audit firm as an industry specialist based on the largest number of clients turns out to be a problematic measure at the city level because there are ''ties'' in many of the unique city-industry combinations, i.e., two or more audit firms have the same number of audit clients and this, in turn, causes difficulty in picking one top leader. This effect is exacerbated given that the large audit fee market share differential between the first and second ranked auditors across all city-specific industries (68 percent versus 27 percent) find in the study. Thus, treating the top two firms or more as co-leaders could potentially induce large measurement error.

In addition, Basioudis and Francis (2007) report no evidence of a fee premium for industry leadership when the number of clients is used to measure industry leadership and firms with ''*ties*'' are coded as co-industry leaders. Besides that, they also document insignificant fee premium when industry specialist audit firm is determined based on clients assets and clients sales, and argued that client assets and sales are noisy proxies for audit fees.

In addition, Neal and Riley (2004) have described two approaches on how industry specialist auditor is measured using the industry market share; 1) the market share approach - either using dummy and continuous, the 2) portfolio approach. While the market share approach consider industry specialist to be those auditors with the largest market share within a particular industry, the portfolio approach determines industry specialist auditor based on the *relative distribution of audit services and related fees across the various industries for each audit firm considered individually".* However, Neal and Riley (2004) also concluded that the use of these two approaches may not give the same results because many research papers suggests that the market and portfolio share measures do not act as substitutes, given that they are unlikely to be measuring the same attributes.

Thus, based on the arguments mentioned above, this study measures auditor industry specialisation using the market share approach based on the clients audit fees to designate industry specialist auditor[10]. The industry specialist auditor (firm and partner) market share in this study are measured at

[9] Nevertheless, Francis *et al*. (2005, 130, footnote 11) point out that audit fees include the effect of an industry premium and, therefore, could potentially bias the measure of industry leadership.
[10] Thus, the results reported in the study would not be robust to various alternative measure of auditor industry specialist based on market share determined using the number of clients, clients assets and clients sales, and also using the portfolio approach to measure the auditor industry leadership.

both the national level and city (or office) level, following the national and-city framework adapted from the work of Ferguson *et al*. (2003), Francis *et al*. (2005), Basioudis and Francis (2007) and Goodwin and Wu (2014).

Thus, the market share of the audit firm and the audit partner are calculated for each particular industry by year, at the national and city level based on the following formulas as used by Goodwin and Wu (2014).

Audit firm national market share =
$$\sum_{j=1}^{Jik} AF\ ijk \ / \ \sum_{i=1}^{Ik} \sum_{j=1}^{Jik} AF\ ijk$$

Audit firm city-industry market share =
$$\sum_{j=1}^{Jikc} AF\ ijkc \ / \ \sum_{i=1}^{Ikc} \sum_{j=1}^{Jikc} AF\ ijkc$$

Audit partner national market share =
$$\sum_{j=1}^{Jikp} AF\ ijkp \ / \ \sum_{i=1}^{Ik} \sum_{j=1}^{Jik} AF\ ijk$$

Audit partner city-industry market share =
$$\sum_{j=1}^{Jikcp} AF\ ijkcp \ / \ \sum_{i=1}^{Ikc} \sum_{j=1}^{Jikc} AF\ ijkc$$

Following Goodwin and Wu (2014), where *i*, *j*, and, *k* represents audit firms, clients, and industries, respectively; *ik* and *ikc* are number of audit firms in industry *k* and industry *k* in city *c*, respectively; *jik, jikc, jikp* and *jikcp* are number of clients served by audit firm *i* in industry *k*, audit firm i in industry *k* in city *c*, and partner *p* in industry *k* in city *c*, respectively; *AFijk, AFijkc, AFijkp* and *AFijkcp* are total audit fees for audit firm i from client j in industry k, audit firm i from client j in industry k in city c, partner p from client j in industry k, and partner p from client j in industry k in city c, respectively. If partner expertise is an important variable in explaining the audit fee premium (earnings management), the coefficient on audit partner national or city-industry market share should be positive and significant (Goodwin and Wu, 2014).

As most of the industry specialist auditor studies (Basioudis and Francis, 2007, Francis *et al*., 2005, Ferguson *et al*., 2003), this study uses indicator variables to define industry specialist auditor. This is because the use of continuous market share variables to represent industry specialist auditors may not be descriptive of the auditing industry, where evidence from prior studies have indicated that there are cases where the second-ranked industry leader may not earn any fee premium as relative to the lower ranked industry leaders (Ferguson *et al*., 2003; Francis *et al*,. 2005; Basioudis and Francis 2007). This, thus suggest that the first-ranked auditors have a more credible reputation for industry expertise, relative to other auditors with large market shares in the industry. As shown in Table 6.4, the means for the top (second) ranked audit firms are about 58 percent (25 percent) and 68 percent (27 percent) for audit firm who are national leaders and city-specific industry leaders, respectively. On the other hand, the means for the top (second) ranked partners are about 40 percent (19 percent) and 60 percent (27 percent) for audit partner who are national leaders and city-specific industry leaders, respectively. These findings suggest that the top-ranked auditors dominate the second-ranked market shares at all the levels examined.

Thus, in order to cater for such a non-linear relationship between the auditor (firm or partner) industry leadership, the indicator variables are used in this study. The specifications vary depending on analysis used, either at the firm national-city framework, partner national-city framework or joint firm-partner national-city framework as describe in Table 5.5 and 5.6 as follows:

Table 5.5: Variables definition for industry specialist auditor under the firm national-city framework and partner national-city framework

Variable	**Variable definition**
Firm national-city framework	
NAT#1	Indicator variable = 1 if the *audit firm* is the top-ranked by market share nationally (*NAT#1*), 0 if otherwise
CITY#1	Indicator variable = 1 if the *audit office* is the top-ranked by city-industry market share (*CITY#1*), 0 if otherwise
JOINT_NAT#1-CITY#1	Indicator variable = 1 if the *audit firm* is the top-ranked by market share nationally (*NAT#1*), and the *office* is the top-ranked by city-industry market share (*CITY#1*), 0 if otherwise
CITY#1_ONLY	Indicator variable = 1 if the *audit firm* is not the top-ranked by market share nationally, and the *office* is the top-ranked by city-industry market share (*CITY#1*), 0 if otherwise
NAT#1_ONLY	Indicator variable = 1 if the *audit firm* is the top-ranked by market share nationally (*NAT#1*), and the *office* is not the top-ranked by city-industry market share, 0 if otherwise
Partner national-city framework	
PARNAT#1	Indicator variable = 1 if the *audit partner* is the top-ranked by market share nationally (*PARNAT#1*), 0 if otherwise
PARCITY#1	Indicator variable = 1 if the *audit partner* is the top-ranked by city-industry market share (*PARCITY#1*), 0 if otherwise
PARJOINT_PARNAT#1-PARCITY#1	Indicator variable = 1 if the *audit partner* is the top-ranked by market share nationally (*PARNAT#1*), and the *audit partner* is the top-ranked by city-industry market share (*PARCITY#1*), 0 if otherwise
PARCITY#1_ONLY	Indicator variable = 1 if the *audit partner* is not the top-ranked by market share nationally, and the *audit partner* is the top-ranked by city-industry market share (*PARCITY#1*), 0 if otherwise
PARNAT#1_ONLY	Indicator variable = 1 if the *audit partner* is the top-ranked by market share nationally (*PARNAT*#1), and the *audit partner* is not the top-ranked by city-industry market share, 0 if otherwise

Following Francis *et al*. (2005), the determination of the audit firm or partner national industry leader (in Model 1) and city-specific industry leader (in Model 2), respectively, is based on an iterative process using the regression model in each analysis in Chapter 6 to Chapter 11, under the respective firm, partner and joint firm-partner framework. The iterative process starts with only one indicator variable for the top-ranked leader (either national or city-specific) in the first estimation, and then adding a second indicator variable for the second-ranked leader in the second estimation, and so on until the introduction of an additional ranking variable is not statistically significant, or in other words, does not have an effect on audit fees. This iterative process determines the top-ranked Big 4 industry leaders (firm or partner) which have a significant coefficient relative to the remaining Big 4 non-industry leaders. For example, *NAT#1* represents as indicator variable coded 1 if the audit firm is the top-ranked industry leader nationally (coded zero if otherwise), given that, based on the iterative process in Model 1 of the firm national-city framework analysis, only the top-ranked audit firms nationally are only able to extract fee premiums. However, if the iterative process indicates that the second-ranked audit firm industry leader nationally is also able to extract a fee premium, then the indicator variable would be *NAT#2* which is coded 1 if the audit firm ranked as the top-two industry leader nationally (coded zero if otherwise). The same iterative process applies in determining city-specific industry leader. Consequently, the determination of the joint national-city industry leader in Model 3 would be derived from the combination of the top-ranked leaders identified in Model 1 and Model 2 respectively. This iterative process applies under both, the firm national-city framework and the partner national-city framework, in which the designation of industry specialist will eventually flow to the joint firm-partner national-city framework analysis in the respective audit quality and earnings quality chapters.

There is a possibility that the reported premiums under the firm national-city framework and partner national-city framework may be overstated due to the confounding effect of failure to control for the effect of partner industry leadership or firm industry leadership in the respective models. To correct for this effect, this study extends the analysis further, by adopting the joint firm-partner national-city industry framework. This study contributes to the auditor industry specialisation literature, as it is the first study that explores the effect of the joint firm-partner national-city framework in its analyses on audit pricing and earnings quality. This joint firm-partner national-city framework represents another approach to testing whether within-office knowledge sharing exists. The following analysis combines both the effect of audit firm and audit partner industry leadership at the national and city industry level, and tests them simultaneously to determine which type of industry leadership is more important (audit firm versus audit partner), and which yields the highest fee premium and earnings quality.

The combinations of the firm national-city framework and partner national-city framework results in the creation of 15 new variables to be examined under the joint firm-partner national-city framework analysis. These variables are described in detail in Table 5.6 below. The default comparison group is the remaining auditors who are neither the national nor city industry leaders at both the audit firm level and audit partner level.

Table 5.6: Variables definition for industry specialist auditor under the joint firm-partner national-city framework

Variable	**Variable definition**
Joint firm-partner national-city framework	
NAT#1-CITY#1_PARNAT#1-PARCITY#1	Indicator variable = 1 if the *audit firm* is the top-ranked by market share nationally (*NAT#1*), the *office* is the top-ranked by city-industry market share (*CITY#1*), the *audit partner* is the top-ranked by market share nationally (*PARNAT#1*), and the *audit partner* is the top-ranked by city-industry market share (*PARCITY#1*), and zero otherwise;
NAT#1-CITY#1_PARNAT#0-PARCITY#1	Indicator variable = 1 if the *audit firm* is the top-ranked by market share nationally (*NAT#1*), the *office* is the top-ranked by city-industry market share (*CITY#1*), the *audit partner* is not the top-ranked by market share nationally (*PARNAT#0*), and the *audit partner* is the top-ranked by city-industry market share (*PARCITY#1*), and zero otherwise;
NAT#1-CITY#0_PARNAT#1-PARCITY#1	Indicator variable = 1 if the *audit firm* is the top-ranked by market share nationally (*NAT#1*), the *office* is not the top-ranked by city-industry market share (*CITY#0*), the *audit partner* is the top-ranked by market share nationally (*PARNAT#1*), and the *audit partner* is the top-ranked by city-industry market share (*PARCITY#1*), and zero otherwise;
NAT#1-CITY#0_PARNAT#0-PARCITY#1	Indicator variable = 1 if the *audit firm* is the top-ranked by market share nationally (*NAT#1*), the *office* is not the top-ranked by city-industry market share (*CITY#0*), the *audit partner* is not the top-ranked by market share nationally (*PARNAT#0),* and the *audit partner* is the top-ranked by city-industry market share (*PARCITY#1*), and zero otherwise;
NAT#0-CITY#1_PARNAT#1-PARCITY#1	Indicator variable = 1 if the *audit firm* is not the top-ranked by market share nationally (*NAT#0*), the *office* is the top-ranked by city-industry market share (*CITY#1*), the *audit partner* is the top-ranked by market share nationally (*PARNAT#1*), and the *audit partner* is the top-ranked by city-industry market share (*PARCITY#1*), and zero otherwise;
NAT#0-CITY#1_PARNAT#0-PARCITY#1	Indicator variable = 1 if the *audit firm* is not the top-ranked by market share nationally (*NAT#0*), the *office* is the top-ranked by city-industry market share (*CITY#1*), the *audit partner* is not the top-ranked by market share nationally (*PARNAT#0*), and the *audit partner* is the top-ranked by city-industry market share (*PARCITY#1*), and zero otherwise;
NAT#0-CITY#0_PARNAT#1-PARCITY#1	Indicator variable = 1 if the *audit firm* is not the top-ranked by market share nationally (*NAT#0*), the *office* is not the top-ranked by city-industry market share (*CITY#0*), the *audit partner* is the top-ranked by market share nationally (*PARNAT#1*), and the *audit partner* is the top-ranked by city-industry market share (*PARCITY#1*), and zero otherwise;
NAT#0-CITY#0_PARNAT#0-PARCITY#1	Indicator variable = 1 if the *audit firm* is not the top-ranked by market share nationally (*NAT#0*), the *office* is not the top-ranked by city-industry market share (*CITY#0*), the *audit partner* is not the

	top-ranked by market share nationally (*PARNAT#0*), and the *audit partner* is the top-ranked by city-industry market share (*PARCITY#1*), and zero otherwise;
NAT#1-CITY#1_PARNAT#1-PARCITY#0	Indicator variable = 1 if the *audit firm* is the top-two ranked by market share nationally (*NAT#*1), the *office* is the top- ranked by city-industry market share (*CITY#1*), the *audit partner* is the top-ranked by market share nationally (*PARNAT#1*), and the *audit partner* is not the top-ranked by city-industry market share (*PARCITY#0*), and zero otherwise;
NAT#1-CITY#1_PARNAT#0-PARCITY#0	Indicator variable = 1 if the *audit firm* is the top-ranked by market share nationally (*NAT#1*), the *office* is the top-ranked by city-industry market share (*CITY#1*), the *audit partner* is not the top-ranked by market share nationally (*PARNAT#0*), and the *audit partner* is not the top-ranked by city-industry market share (*PARCITY#0*), and zero otherwise;
NAT#1-CITY#0_PARNAT#1-PARCITY#0	Indicator variable = 1 if the *audit firm* is the top-ranked by market share nationally (*NAT#1*), the *office* is not the top-ranked by city-industry market share (*CITY#0*), the *audit partner* is the top-ranked by market share nationally (*PARNAT#1*), and the *audit partner* is not the top-ranked by city-industry market share (*PARCITY#0*), and zero otherwise;
NAT#1-CITY#0_PARNAT#0-PARCITY#0	Indicator variable = 1 if the *audit firm* is the top-ranked by market share nationally (*NAT#1*), the *office* is not the top-ranked by city-industry market share (*CITY#0*), the *audit partner* is not the top-ranked by market share nationally (*PARNAT#0*), and the *audit partner* is not the top-ranked by city-industry market share (*PARCITY#0*), and zero otherwise;
NAT#0-CITY#1_PARNAT#1-PARCITY#0	Indicator variable = 1 if the *audit firm* is not the top- ranked by market share nationally (*NAT#0*), the *office* is the top-ranked by city-industry market share (*CITY#1*), the *audit partner* is the top-ranked by market share nationally (*PARNAT#1*), and the *audit partner* is not the top-ranked by city-industry market share (*PARCITY#0*), and zero otherwise;
NAT#0-CITY#1_PARNAT#0-PARCITY#0	Indicator variable = 1 if the *audit firm* is not the top-ranked by market share nationally (*NAT#0*), the *office* is the top-ranked by city-industry market share (*CITY#1*), the *audit partner* is not the top-ranked by market share nationally (*PARNAT#0*), and the *audit partner* is not the top-ranked by city-industry market share (*PARCITY#0*), and zero otherwise;
NAT#0-CITY#0_PARNAT#1-PARCITY#0	Indicator variable = 1 if the *audit firm* is not the top-ranked by market share nationally (*NAT#0*), the *office* is not the top-ranked by city-industry market share (*CITY#0*), the *audit partner* is the top-ranked by market share nationally (*PARNAT#1*), and the *audit partner* is not the top-ranked by city-industry market share (*PARCITY#0*), and zero otherwise;

5.5.2 Corporate governance

Next, this section presents the variable definition and measurement for the corporate governance variables selected for the study, which are female directors, foreign directors, internal audit, and audit committee characteristics of effectiveness including size, independence, financial expertise and activity. These corporate governance variables represents the independent variables that are examined in both, the audit quality and earnings quality chapters. The definition of the corporate governance variables is summarised in Table 5.7 below:

Table 5.7: Variables definition for corporate governance characteristics

Variables	Definition
BODFEM	proportion of female directors on board
BODFOREIGN	proportion of foreign directors on board
INTAUD	indicator variable, 1 = presence of internet audit function; 0 = otherwise
ACSIZE	number of directors on audit committee
ACINDP	proportion of non-executive directors on audit committee
ACFINEXP	proportion of directors with financial expertise on audit committee
ACMEET	number of audit committee meetings

5.5.2.1 Female directors (*BODFEM*)

The female directors on board is measured based on the number of female director, in proportion to the total board members. This definition follows Gul *et al*. (2008) and Garcia-Meca *et al*. (2015).

5.5.2.2 Foreign directors (*BODFOREIGN*)

The foreign directors on board is measured based on the number of foreign nationality director on board, in proportion to the total board members. This definition follows Garcia-Meca *et al*. (2015) in their study of board diversity and performance.

5.5.2.3 Internal audit (*INTAUD*)

Following Davidson *et al*. (2005), the internal audit is an indicator variable representing the presence of an internal audit function in the company, and 0 if otherwise.

5.5.2.4 Audit committee size *(ACSIZE)*

The audit committee size is measured based on the total number of audit committee members presented at the end of the financial year; this definition is consistent with Yang and Krishnan (2005).

5.5.2.5 Audit committee independence *(ACINDP)*

Consistent with DeFond and Jiambalvo (1994), Beasley (1996) and Bradbury *et al*. (2006), the audit committee independence is measured based on the total number of non-executive directors in the audit committee members, in proportion to the total members.

5.5.2.6 Audit committee financial expertise (*ACFINEXP*)

The audit committee financial expertise, in this study, is measured by the number of audit committee members who possess either accounting or financial qualification or experience, in proportion to the total number of audit committee members. This includes any academic background or qualifications in accounting and finance, as well as experience as a Chief Finance Officer, Finance Manager, accountants, auditor or working in the banking industry. This definition is similar the ones used in prior studies by DeFond *et al*. (2005) and Krishnan and Visvanathan (2008). The accounting or financial knowledge of the audit committee should enable them to better understand, discuss and resolve the financial reporting issues.

5.5.2.7 Audit committee activity (*ACMEET*)

The audit committee level of activity is measured based on number of meetings held by the committee during the year. This definition is consistent with the one used by Krishnan and Visvanathan, (2009) and Zaman *et al*. (2011) in their studies.

5.6 Model specification

This section presents and discusses the models used to examine the two empirical studies; 1) the effect of industry specialist auditor and corporate governance on audit quality and 2) the effect of industry specialist auditor and corporate governance on earnings quality. For the first empirical study, the independent variables are industry specialist auditor variables, the corporate governance variables and the control variables, which are regressed on audit fees (*LAF*), as the dependent variable. For the second empirical study, the independent variables are industry specialist auditor variables, the corporate governance variables and the control variables, which are then regressed on three different measures of earnings quality. The dependent variables for the earnings quality models are; 1) the discretionary accruals which controls for firm's performance (*DAC_PERF*) based on Kothari *et al*., (2005) model, 2) the accrual estimation error (*AEE*) based on the Dechow and Dichev's modified accrual quality model by McNichols (2002), and 3) the likelihood of reporting a profit or avoiding a loss (*PROFIT*) model adopted from Francis *et al*. (2013).

There are two empirical models that will be used to address the research objectives, namely: 1) the audit fee model and 2) the earnings management models. The first empirical model analyse the effect of corporate governance and industry specialist auditor on audit fee, while the second empirical model examines the effectiveness of corporate governance and industry specialist auditor in promoting earnings quality. The variables definitions and measurements included in the models are clearly defined in their respective model below.

5.6.1 Audit fee model (*LAF* Model)

For the analysis of audit premium, the study adopts the internationally well-established audit fee determinants model introduced by Simunic (1980) and modified by Craswell *et al*. (1995). This model has been robust across different samples, time periods, countries, and sensitivity analyses for model misspecification (Francis and Simon 1987; Chan *et al*., 1993; Basioudis and Francis, 2007). Besides the hypothesised variables (auditor industry specialisation, board and audit committee characteristics and internal audit function), the model controls for the effect of other core determinants' of audit fees, namely the client's size, complexity, risk, profitability, leverage, non-audit fees and auditor's production costs and institutional ownership (Cobbin, 2002; Hay *et al*., 2006; Basioudis and Francis, 2007). The audit fee model is estimated as the industry fixed-effects and year fixed-effects model to control for systematic differences in fees across the 13 industries and four years period examined in the sample. An industry fixed-effects model controls for potential omitted variables in case there are any systematic differences across industries and years with respect to client's company size, risk or audit complexity that are associated to audit fees (Basioudis and Francis, 2007). The ordinary least-squares (OLS) regression model[11] is specified as follows:

$$
\begin{aligned}
LAF = \alpha + \beta_1\, LNAF + \beta_2\, LTA + \beta_3\, SQRTSUBS + \beta_4\, ROI + \beta_5\, DE + \beta_6\, FOREIGN \\
+ \beta_7\, QUICK + \beta_8\, CATA + \beta_9\, OPINION + \beta_{10}\, LONDON + \beta_{11}\, BUSY \\
+ \beta_{12}\, LOSS + \beta_{13}\, INITIAL + \beta_{14}\, INSOWN + \beta_{15}\, ISA + \beta_{16}\, BODFEMALE \\
+ \beta_{17}\, BODFOREIGN + \beta_{18}\, INTAUD + \beta_{19}\, ACSIZE + \beta_{20}\, ACINDP + \\
+ \beta_{21} ACFINEXP + \beta_{22} ACMEET + \varepsilon
\end{aligned}
$$

(Equation 1)

where:

LAF	= natural log of audit fees in GBP'000
LNAF	= natural log of non-audit fees in GBP'000 paid to the incumbent auditor
LTA	= natural log of total assets in GBP'000
SQRTSUBS	= square root of total subsidiaries
ROI	= ratio of earnings before interest and tax to total assets
DE	= ratio of long-term debt to total assets
FOREIGN	= proportion of total sales from foreign operations;
QUICK	= ratio of current assets (less inventories) to current liabilities
CATA	= ratio of current assets to total assets
OPINION	= indicator variable, 1 = qualified or going concern audit report; 0 = otherwise
LONDON	= indicator variable, 1 = London-based company, 0 = otherwise
BUSY	= indicator variable, 1 = December 31st or March 31st year-end, 0 = otherwise
LOSS	= indicator variable, 1 = loss in any of the past three years, 0 = otherwise
INITIAL	= indicator variable, 1 = new auditor in the current or prior year, 0 = otherwise
INSOWN	= proportion of ordinary shares held by institutional shareholders who individually own 5 percent or more of outstanding ordinary shares
ISA	= indicator variable, 1 = industry specialist auditor (specification varies as described in Section 5.4.1 earlier), 0 = otherwise
BODFEM	= proportion of female directors on board
BODFOREIGN	= proportion of foreign directors on board
INTAUD	= indicator variable, 1 = presence of internet audit function; 0 = otherwise

[11] According to Chaney *et al*. (2004), the estimations of models with both Big 4 and no-Big 4 clients lead to the problem of selection bias, as clients selected their own auditor, instead of being randomly. Although some studies use the Heckman two-stage procedure to correct for this selection bias (e.g. Sun and Liu, 2013). However, as Francis and Lennox (2007) and Clatworthy *et al*. (2009, p. 139) highlighted that there is no confirmatory evidence in the econometrics literature on the reliability of the Heckman two-stage procedure to rectify the selection bias problem.

ACSIZE = number of directors on audit committee
ACINDP = proportion of non-executive directors on audit committee
ACFINEXP = proportion of directors with financial expertise on audit committee
ACMEET = number of audit committee meetings
ε = error term

The 15 control variables used in the model above are the standard audit fee control variables used in the audit fee models in previous studies. the model controls for the effect of other core determinants' of audit fees, namely the client's size, complexity, risk, profitability, leverage, non-audit fees and auditor's production costs and institutional ownership (Cobbin, 2002; Hay *et al*., 2006). These variables are relatively similar to those adopted in studies examining the effect of industry specialist auditors and corporate governance characteristics on audit fees (Basioudis and Francis, 2007; Francis *et al*., 2005; Zaman *et al*., 2011).

Following Whisenant *et al*., (2003) and Basioudis and Francis (2007), positive association is expected between audit fees and non-audit fees (*LNAF*). *LTA* is a measure of firm size and is defined as the natural log of the total assets (Simunic, 1980; Abbott *et al*., 2003a; Carcello *et al*., 2002). As the firm size increased, the auditors extend the audit scope and audit test accordingly. Such extensive efforts increase audit hours and fees, and thus the present study predicts a positive relationship between total assets and audit fees. *SQRTSUBS* and *FOREIGN* represents the measure of complexity of clients operation. Positive association is expected between audit fees and *SQRTSUBS* and *FOREIGN*, given that the auditor needs to exert more effort and time to deal with client's complex operational issues, leading to higher audit fees (Simunic, 1980; Craswell and Francis, 1999; Abbott *et al*., 2003a; Carcello *et al*., 2002).

According to Hay *et al* (2006), *ROI* and *LOSS* measure clients risk of failing, as the auditor will lose a client if they are not financially viable (Hay *et al*., 2006). On the other hand, a dummy variable for the presence of loss (Hay *et al*., 2006) is also a proxy of client risk. The association between the client's loss and fee charged by the auditor is expected to be positive. This is because company's poor performance will lead to greater risk for the auditor, which results in higher fees. According to Basioudis and Francis (2007), clients with a larger *QUICK* ratio are less risky. Thus negative relationship is expected between audit fees and Quick ratio. According to Rubin (1988) during the busy season between 31st March and 31st December, companies having their financial year end during this period would have to pay higher audit fees. Thus, positive association is expected between busy season (*BUSY*) and audit fees. According to Chan *et al*., (1993) and Basioudis and Francis (2007), client companies that are located in London (*LONDON*) pays higher audit fees due to their higher living cost. Following Basioudis and Francis (2007), higher audit fees are expected from companies with greater inherent risk (higher *DE* and *CATA* ratios), given their higher audit risk and greater likelihood of business failing (Hay *et al*., *2006).* In addition, prior studies (Simunic and Stein, 1996;

Menon and Williams, 2001, Pratt and Stice, 1994) assert that clients with high leverage (*DE*) face higher perceived litigation risk, and the auditor would need to increase its audit effort to reduce their audit risk.

Following prior studies (Simunic, 1980; Francis, 1984; Francis and Simon, 1987; Davis *et al*., 1993 Basioudis and Francis, 2007; Basioudis *et al*., 2008), positive association is expected between qualified and going concern audit opinion (*OPINION*) and audit fees, as the companies receiving such opinions are likely to be subject to more thorough examinations by the auditors. These thorough examinations include additional audit work in terms of more substantive testing and documentation, as well as engaging in lengthy discussions and negotiations with the client in order to arrive at their final opinion. Following Basioudis and Francis (2007), negative relationship is expected between initial engagement (*INITIAL*) and audit fees, as evidence from prior literature suggests that there are lower fees due to lowballing effects in the first or second year of engagement.

Mitra *et al*. (2007) and Zaman (2011) argued that large and sophisticated shareholders (*INSOWN*) actively monitor management. This active monitoring is expected to lower the inherent risk that the financial statement would be materially misstated, thus, auditors would be likely to reduce their assessment of audit risk for the client, leading to lower audit effort and consequently, lower audit fees. Following Chung *et al*. (1995), institutional ownership is measured as proportion of ordinary shares held by institutional shareholders who individually own 5 percent or more of outstanding ordinary shares in the company. Thus, consistent with these prior studies, negative relationship is expected between institutional ownership and audit fees.

5.6.2 Earnings quality models

There are three earnings quality models that are used for the second empirical analyses on the relationship between industry specialist auditor, corporate governance and earnings quality. the three earnings quality proxies that will be examined in this study are; 1) the discretionary accruals which controls for firm's performance based on Kothari *et al*., (2005) model (*DAC_PERF*), 2) the accrual estimation error (*AEE*) based on the Dechow and Dichev's modified accrual quality model by McNichols (2002), and 3) the likelihood of reporting a profit (avoiding a loss) model adopted from Francis *et al*. (2013) (*PROFIT*). For the *DAC_PERF* and *AEE* models, the model specification is similar to those used by Klein (2002) and Bédard *et al*. (2004) in their study examining the relationship between board characteristics, audit committee characteristics, auditor quality and earnings management. Whereas the control variables included in the model are found in prior studies to be significantly related to company's level of discretionary accruals (Reichelt and Wang, 2010; Choi *et al*., 2010; Francis *et al*., 2013). The earnings management models are estimated as the industry fixed-effects and year fixed-effects model to control for systematic differences in fees across the 13 industries and four years period examined in the sample. The earnings quality model for discretionary accruals and accrual estimation error are as follow:

$$
\begin{aligned}
DAC\_PERF \quad or \quad AEE = {} & \alpha + \beta_1 LTA + \beta_2 PYTAC + \beta_3 DE + \beta_4 GROWTH + \beta_5 MB + \beta_6 CFO \\
& + \beta_7 LOSS + \beta_8 ALTMAN + \beta_9 BLOCKOWN + \beta_{10} BIG4 + \beta_{11} SECOND \\
& + \beta_{12} ISA + \beta_{13} BODFEM + \beta_{14} BODFOREIGN + \beta_{15} INTAUD \\
& + \beta_{16} ACSIZE + \beta_{17} ACINDP + \beta_{18} ACFINEXP + \beta_{19} ACMEET + \varepsilon
\end{aligned}
$$

(Equation 2)

where:

DAC_PERF	= magnitude and direction of discretionary accruals based on the model by Kothari *et al*., (2005) which controls for firm's performance
AEE	= accrual estimation error (*AEE*) based on the Dechow and Dichev's modified accrual quality model by McNichols (2002)
LTA	= natural log of total assets in GBP'000
DE	= ratio of long-term debt to total assets
PYTAC	= net income from continuing operations minus operating cash flow in year t-1 scaled by total assets at year t-2
GROWTH	= one-year growth rate in sales
MB	= the market value of equity divided by book value of equity
CFO	= operating cash flow in year t scaled by total assets at year t-1
LOSS	= indicator variable, 1 = loss in any past three years, 0 = otherwise
ALTMAN	= Altman's (1983) scores
BLOCKOWN	= proportion of ordinary shares held by institutional blockholders who individually owns 3 percent or more of outstanding ordinary shares
BIG4	= indicator variable, 1 = client Big 4 audit firms, 0 = otherwise
SECOND	= indicator variable, 1 = client of Second-tier audit firms, 0 = otherwise
ISA	= indicator variable, 1 = industry specialist auditor (specification varies), 0 = otherwise
BODFEM	= proportion of female directors on board
BODFOREIGN	= proportion of foreign directors on board
INTAUD	= indicator variable, 1 = presence of internet audit function; 0 = otherwise
ACSIZE	= number of directors on audit committee
ACINDP	= proportion of non-executive directors on audit committee
ACFINEXP	= proportion of directors with accounting or financial expertise on audit committee
ACMEET	= number of audit committee meetings
ε	= error term

Whereas the earnings quality model for the likelihood of reporting a profit rather than a loss is as follow:

$$\begin{aligned} PROFIT = {} & \alpha + \beta_1 LTA + \beta_2 DE + \beta_3 TAC + \beta_4 GROWTH + \beta_5 MB + \beta_6 CFO + \beta_7 LAG\_LOSS \\ & + \beta_8 ALTMAN + \beta_9 BLOCKOWN + \beta_{10} BIG4 + \beta_{11} SECOND + \beta_{12} ISA + \beta_{13} BODFEM \\ & + \beta_{14} BODFOREIGN + \beta_{15} INTAUD + \beta_{16} ACSIZE + \beta_{17} ACINDP + \beta_{18} ACFINEXP \\ & + \beta_{19} ACMEET + \varepsilon \end{aligned}$$

(Equation 3)

where:

PROFIT	= indicator variable, 1 = reported positive net income before extraordinary item, 0 = otherwise
TAC	= net income from continuing operations minus operating cash flow in year t scaled by total assets at year t-1
LAG_LOSS	= indicator variable, 1 = loss in the prior year, 0 = otherwise
ε	= error term

LTA, DE, GROWTH, MB, CFO, ALTMAN, BLOCKOWN, BIG4, SECOND, ISA, BODFEM, BODFOREIGN, INTAUD, ACSZIE, ACINDP, ACFINEXP and *ACMEET* are defined as before in Equation (2).

Following Ashbaugh *et al*. (2003) lagged total accruals (*PYTAC*) are included in the model so that reversal of accruals overtime could be controlled for. Pincus and Rajgopal (2002) assert that management of larger firms are more pressurised to manage earnings to achieve the target. Following Douma Prawit (2009) and Dechow and Dichev (2002), firm size is measured using natural logarithm of company's total assets (*LTA*), and is expected to be positively related to earnings management. Following Becker *et al*. (1998) and DeFond and Jiambalvo (1994), companies with higher leverage have higher likelihood to manage earnings in order to meet debt covenants, thus positive association is expected between *DE* and earnings management (Prawit *et. al*, 2009). Consistent with Reichelt and Wang (2010), negative association is expected between *ALTMAN* and earnings management. This is because Altman score measures the likelihood of company survival, thus higher Altman score represents lower bankruptcy risk attached to the company.

Following Prawit *et al*. (2009), companies experiencing loss (*LOSS*) or facing financial difficulties have greater incentives to manage earnings. Therefore, either *LOSS* or *LAG_LOSS* is included in the model to capture this effect, and positive relationship is expected between loss and earnings management. Also, consistent with Reichelt and Wang (2010), companies audited by the Big 4 firms and the second tier audit firms have lower accruals, thus negative relationship should be expected.

Wang (2006) find that larger size of blockholder is positively associated with management propensity to commit and detect fraud using three proxies for earnings quality: abnormal accruals, earnings informativeness, and persistence of transitory loss components. Bushee (2001) documents that the presence of long-term institutional holdings increases the likelihood of earnings management, while short-term institutional holdings reduce earnings management. Consistent with prior studies, positive relationship is expected between *BLOCKOWN* and earnings management. Consistent with Prawit *et al*. (2009), Reichelt and Wang (2010) and Francis *et al.* (2013), firms with more growth opportunities are associated with higher earnings management activities. Thus, positive association is expected between sales growth (*GROWTH*) and market to book ratio (*MB*) with earnings management. Following Kasznik (1999), Kothari *et al*. (2005) and Choi *et al*. (2010), cash flow from operation is included in the model to control for the potential correlation between accruals and cash flows (*CFO*).

5.6.3 Earnings quality measures

Accrual is found to be the most popular method of earnings management amongst managers (Goncharov, 2005). Thus, in this study, the earnings management is estimated using a cross-sectional variation in the performance-adjusted model by Kothari *et al*. (2005), the McNichols (2002) model, and the likelihood of reporting a loss rather than a profit model.

5.6.3.1 Performance-matched discretionary accruals (*DAC_PERF*)

Kothari *et al.* (2005) introduced the performance-matched discretionary accruals model, which is considered to be more superior and more reliable than the Jones and modified Jones (1991) model, which was introduced earlier by Dechow *et al*. (1995). This is because the performance-matched discretionary accruals model controls for firm performance effects through inclusion of the lagged return on assets (*LROA*) variable in its model, besides including an intercept term to reduce the noise and increases the accuracy of the discretionary accrual measure.

In the second empirical study in the PhD thesis, the performance-matched discretionary accruals model introduced by Kothari *et al*. (2005) will be used as the first measure of earnings quality. The accruals variable is referred to as *DAC_PERF*, which represents a continuous measure of the absolute value of the performance-matched discretionary accruals. In addition, the sign of the discretionary accruals will also be examined. To calculate the non-discretionary accrual (*NDA*), the following equation is estimated by year and industry:

$$NDA = \alpha 1\ (1/LTA) + \alpha 2\ (\Delta REV - \Delta REC\ /LTA) + \alpha 3\ (PPE/LTA) + \alpha 4\ (LROA)$$

Where:
NDA = non-discretionary accruals
LTA = total assets in year t-1
ΔREV = change in revenues
ΔREC = change in receivables
PPE = property, plant and equipment (gross) in year t
LROA = return on assets in year t-1

Before the *NDA* can be calculated, the coefficients parameters α1, α2 and α3 need to be estimated using an OLS regression for all the firms with available data within the same industry and year. For this purpose, the study adopts the methodology used in another U.K. study by Athanasakou *et al*. (2009), which sets at least minimum of six firms in each industry per year.

$$TA/LTA = \alpha 1\ (1/LTA) + \alpha 2\ (\Delta REV - \Delta REC\ /LTA) + \alpha 3\ (PPE/LTA) + \alpha 4\ (LROA) + \varepsilon$$

Where:
TA = total accruals in year t
LTA = total assets in year t-1
ΔREV = change in revenues
PPE = property, plant and equipment (gross) in year t
LROA = return on asset in year t-1

Finally, the discretionary accruals can be calculated by employing the equation below:

$$DA = (TA/\ LTA) - NDA$$

Where:
DA = discretionary accruals
TA = total accruals in year t
LTA = total assets in year t-1
NDA = non-discretionary accruals
ε = error term,

5.6.3.2 Accrual estimation error (*AEE*)

Quality of accruals could be measured based on how the accruals are related to the current, preceding year and future year cashflows (Dechow and Dichev, 2002). Earnings in the financial statements represents the current year operating cashflow which have been modified by using accruals so show a better firm's performance in the future years. Thus, a "*good*" accrual should estimation should reverse itself as operating cashflows either in the current or future financial periods.

While the Jones (1991) variants of discretionary accruals models used an indirect measure of accruals quality, the Dechow and Dichev's (2002) model of accruals quality that has been modified by McNichols (2002) provides a more direct measure of accruals quality. This is because the calculation of accruals quality is itself derived from the fundamental accounting data available in the company's financial statements. Using the McNichols (2002) accruals quality model allow the prediction of accrual estimation error which is determined by regressing the previous, current, and future cashflows on current accruals using industry level pooled cross-sectional regressions, estimating them by industry and year. McNichols (2002) has demonstrated that the inclusion of two additional variables, namely the changes in revenue and PPE to the cross-sectional Dechow and Dichev (2002) regression, contribute to significant increase in the model explanatory power (R^2), which thus reduces measurement error. Accruals quality is measured by estimating the following regression by industry and year;

$$\Delta WC_t = \alpha 0 + \alpha 1\ CFO_{t-1} + \alpha 2\ CFO_t + \alpha 3\ CFO_{t+1} + \alpha 4\ \Delta Rev_t + \alpha 5\ PPEt + \varepsilon_t$$

Where:
ΔWC_t = (ΔCurrent Assets – ΔCurrent Liabilities – ΔCash) / total assets in year $_t$
CFO_{t-1} = (Cash flows from operations in year $_{t-1}$) / total assets in year $_{t-1}$
CFO_t = Cash flows from operations in year $_t$ / total assets in year $_t$
CFO_{t+1} =(Cash flows from operations year in year $_{t+1}$) / total assets in year $_{t+1}$
ΔRev_t = (Sales in year$_t$ – Sales in year$_{t-1}$) / total assets in year $_t$
PPE_t = Gross property, plant and equipment in year $_t$ / total asset in year $_t$

Operationally, this model measures accrual quality for each firm by using the absolute value of the residual as the measure of accrual quality (Srindhi and Gul, 2011; Baxter and Cotter, 2009). The high value of absolute residual for each sample company signifies the low quality of earnings. The residuals from the modified regression represent the accrual estimation error, which is an inverse measure of accruals quality. According to Francis *et al*. (2005), discretionary accruals quality is attributable to managers' estimates and accounting implementation decisions and is priced by investors' more than discretionary accruals and other proxies for accruals quality. The accrual estimation error model is unsigned.

5.6.3.3 Likelihood to report a profit (avoid a loss) (*PROFIT*)

The third measure of earnings quality is the likelihood of reporting a profit rather than a loss, as adapted from Francis *et al*. (2003). According to Burgstahler and Dichev (1997) and Graham *et al.*, (2005), companies with high earnings quality do not avoid reporting losses. Consistently, Ball and Shivakumar (2008) assert that earnings that are of high-quality are conservative, whereas earnings that are of low-quality are earnings that are managed upward such as through income-increasing accruals. According to Burgstahler and Dichev (1997), "*earnings are managed to avoid earnings decreases and losses*". They have found evidence that incentives for earnings management to avoid the reporting of earnings decreases is stronger and became increasingly prevalent in the period where there are preceding string of earnings increases (Burgstahler and Dichev, 1997). Managers have incentives to avoid reporting losses as they prefer to report positive earnings to attract investors through media coverage, annual report, websites and news. Most earnings manipulation takes place through manipulation of cash flow from operations and changes in working capital. Prospect theory suggests that incentive to manage earning is high when moving from relative or absolute loss to a gain (Kahneman and Tversky, 1979). Furthermore, managers opportunistically avoid reporting earnings decreases and losses to decrease the costs imposed in transactions with stakeholders, assuming that stakeholder decisions are often based on heuristic cut-offs at zero changes or levels of earnings

(Burgstahler and Dichev, 1997). Following Francis *et al*. (2013), *PROFIT* is coded as 1 to be consistent with the directional prediction for accruals, as a higher-quality audit is expected to result in a lower likelihood of managers reporting a profit (i.e., reporting a loss), just as high-quality audits are expected to result in smaller accruals.

5.7 Summary of variables definition for the study

Table 5.8: Summary of variables definition

Variable	**Variable definition**
Industry specialist auditor variables:	
Firm national-city framework	
NAT#1	Indicator variable = 1 if the *audit firm* is the top-ranked by market share nationally (*NAT#1*), 0 if otherwise
CITY#1	Indicator variable = 1 if the *audit office* is the top-ranked by city-industry market share (*CITY#1*), 0 if otherwise
JOINT_NAT#1-CITY#1	Indicator variable = 1 if the *audit firm* is the top-ranked by market share nationally (*NAT#1*), and the *audit office* is the top-ranked by city-industry market share (*CITY#1*), 0 if otherwise
CITY#1_ONLY	Indicator variable = 1 if the *audit firm* is not the top-ranked by market share nationally, and the *audit office* is the top-ranked by city-industry market share (*CITY#1*), 0 if otherwise
NAT#1_ONLY	Indicator variable = 1 if the *audit firm* is the top-ranked by market share nationally (NAT#1), and the *audit office* is not the top-ranked by city-industry market share, 0 if otherwise
Partner national-city framework	
PARNAT#1	Indicator variable = 1 if the *audit partner* is the top-ranked by market share nationally (*PARNAT#1*), 0 if otherwise
PARCITY#1	Indicator variable = 1 if the *audit partner* is the top-ranked by city-industry market share (*PARCITY#1*), 0 if otherwise
PARJOINT_PARNAT#1-PARCITY#1	Indicator variable = 1 if the *audit partner* is the top-ranked by market share nationally (*PARNAT#1*), the *audit partner* is the top-ranked by city-industry market share (*PARCITY#1*), 0 if otherwise
PARCITY#1_ONLY	Indicator variable = 1 if the *audit partner* is not the top-ranked by market share nationally, and the *audit partner* is the top-ranked by city-industry market share (*PARCITY#1*), 0 if otherwise
PARNAT#1_ONLY	Indicator variable = 1 if the *audit partner* is the top-ranked by market share nationally (*PARNAT#1*), and the *audit partner* is not the top-ranked by city-industry market share, 0 if otherwise

Joint firm-partner national-city framework	
NAT#1-CITY#1_PARNAT#1-PARCITY#1	Indicator variable = 1 if the *audit firm* is the top-ranked by market share nationally (*NAT#1*), the *audit office* is the top-ranked by city-industry market share (*CITY#1*), the *audit partner* is the top-ranked by market share nationally (*PARNAT#1*), and the *audit partner* is the top-ranked by city-industry market share (*PARCITY#1*), and zero otherwise
NAT#1-CITY#1_PARNAT#0-PARCITY#1	Indicator variable = 1 if the *audit firm* is the top-ranked by market share nationally (*NAT#1*), the *audit office* is the top-ranked by city-industry market share (*CITY#1*), the *audit partner* is not the top-ranked by market share nationally (*PARNAT#0*), and the *audit partner* is the top-ranked by city-industry market share (*PARCITY#1*), and zero otherwise
NAT#1-CITY#0_PARNAT#1-PARCITY#1	Indicator variable = 1 if the *audit firm* is the top-ranked by market share nationally (*NAT#1*), the *audit office* is not the top-ranked by city-industry market share (*CITY#0*), the *audit partner* is the top-ranked by market share nationally (*PARNAT#1*), and the *audit partner* is the top-ranked by city-industry market share (*PARCITY#1*), and zero otherwise
NAT#1-CITY#0_PARNAT#0-PARCITY#1	Indicator variable = 1 if the *audit firm* is the top-ranked by market share nationally (*NAT#1*), the *audit office* is not the top-ranked by city-industry market share (*CITY#0*), the *audit partner* is not the top-ranked by market share nationally (*PARNAT#0),* and the *audit partner* is the top-ranked by city-industry market share (*PARCITY#1*), and zero otherwise
NAT#0-CITY#1_PARNAT#1-PARCITY#1	Indicator variable = 1 if the *audit firm* is not the top-ranked by market share nationally (*NAT#0*), the *audit office* is the top-ranked by city-industry market share (*CITY#1*), the *audit partner* is the top-ranked by market share nationally (*PARNAT#1*), and the *audit partner* is the top-ranked by city-industry market share (*PARCITY#1*), and zero otherwise
NAT#0-CITY#1_PARNAT#0-PARCITY#1	Indicator variable = 1 if the *audit firm* is not the top-ranked by market share nationally (*NAT#0*), the *audit office* is the top-ranked by city-industry market share (*CITY#1*), the *audit partner* is not the top-ranked by market share nationally (*PARNAT#0*), and the *audit partner* is the top-ranked by city-industry market share (*PARCITY#1*), and zero otherwise
NAT#0-CITY#0_PARNAT#1-PARCITY#1	Indicator variable = 1 if the *audit firm* is not the top-ranked by market share nationally (*NAT#0*), the *audit office* is not the top-ranked by city-industry market share (*CITY#0*), the *audit partner* is the top-ranked by market share nationally (*PARNAT#1*), and the *audit partner* is the top-ranked by city-industry market share (*PARCITY#1*), and zero otherwise
NAT#0-CITY#0_PARNAT#0-PARCITY#1	Indicator variable = 1 if the *audit firm* is not the top-ranked by market share nationally (*NAT#0*), the *audit office* is not the top-ranked by city-industry market share (*CITY#0*), the *audit partner* is not the top-ranked by market share nationally (*PARNAT#0*), and the *audit*

	partner is the top-ranked by city-industry market share (*PARCITY#1*), and zero otherwise
NAT#1-CITY#1_PARNAT#1-PARCITY#0	Indicator variable = 1 if the *audit firm* is the top-two ranked by market share nationally (*NAT#*1), the *audit office* is the top- ranked by city-industry market share (*CITY#1*), the *audit partner* is the top-ranked by market share nationally (*PARNAT#6*), and the *audit partner* is not the top-ranked by city-industry market share (*PARCITY#0*), and zero otherwise
NAT#1-CITY#1_PARNAT#0-PARCITY#0	Indicator variable = 1 if the *audit firm* is the top-ranked by market share nationally (*NAT#1*), the *audit office* is the top-ranked by city-industry market share (*CITY#1*), the *audit partner* is not the top-ranked by market share nationally (*PARNAT#0*), and the *audit partner* is not the top-ranked by city-industry market share (*PARCITY#0*), and zero otherwise
NAT#1-CITY#0_PARNAT#1-PARCITY#0	Indicator variable = 1 if the *audit firm* is the top-ranked by market share nationally (*NAT#1*), the *audit office* is not the top-ranked by city-industry market share (*CITY#0*), the *audit partner* is the top-ranked by market share nationally (*PARNAT#1*), and the *audit partner* is not the top-ranked by city-industry market share (*PARCITY#0*), and zero otherwise
NAT#1-CITY#0_PARNAT#0-PARCITY#0	Indicator variable = 1 if the *audit firm* is the top-ranked by market share nationally (*NAT#1*), the *audit office* is not the top-ranked by city-industry market share (*CITY#0*), the *audit partner* is not the top-ranked by market share nationally (*PARNAT#0*), and the *audit partner* is not the top-ranked by city-industry market share (*PARCITY#0*), and zero otherwise
NAT#0-CITY#1_PARNAT#1-PARCITY#0	Indicator variable = 1 if the *audit firm* is not the top-ranked by market share nationally (*NAT#0*), the *audit office* is the top-ranked by city-industry market share (*CITY#1*), the *audit partner* is the top-ranked by market share nationally (*PARNAT#1*), and the *audit partner* is not the top-ranked by city-industry market share (*PARCITY#0*), and zero otherwise
NAT#0-CITY#1_PARNAT#0-PARCITY#0	Indicator variable = 1 if the *audit firm* is not the top-ranked by market share nationally (*NAT#0*), the *audit office* is the top-ranked by city-industry market share (*CITY#1*), the *audit partner* is not the top-ranked by market share nationally (*PARNAT#0*), and the *audit partner* is not the top-ranked by city-industry market share (*PARCITY#0*), and zero otherwise
NAT#0-CITY#0_PARNAT#1-PARCITY#0	Indicator variable = 1 if the *audit firm* is not the top-ranked by market share nationally (*NAT#0*), the *audit office* is not the top-ranked by city-industry market share (*CITY#0*), the *audit partner* is the top-ranked by market share nationally (*PARNAT#1*), and the *audit partner* is not the top-ranked by city-industry market share (*PARCITY#0*), and zero otherwise
Note: The rankings designation for the industry leader depends on the iterative process performed for each analysis, as explained in Section 5.5.1 earlier.	

Corporate governance variables	
BODFEM	proportion of female directors on board
BODFOREIGN	proportion of foreign directors on board
INTAUD	indicator variable, 1 = presence of internet audit function; 0 = otherwise
ACSIZE	number of directors on audit committee
ACINDP	proportion of non-executive directors on audit committee
ACFINEXP	proportion of directors with financial expertise on audit committee
ACMEET	number of audit committee meetings
Dependent variables for audit quality analysis	
LAF	natural log of audit fees in GBP'000
Control variables for audit fee model	
LNAF	natural log of non-audit fees in GBP'000 paid to the incumbent auditor
LTA	natural log of total assets in GBP'000
SQRTSUBS	square root of total subsidiaries
ROI	ratio of earnings before interest and tax to total assets
DE	ratio of long-term debt to total assets
FOREIGN	proportion of total sales from foreign operations
QUICK	ratio of current assets (less inventories) to current liabilities
CATA	ratio of current assets to total assets
OPINION	indicator variable, 1 = qualified or going concern audit report; 0 = otherwise
LONDON	indicator variable, 1 = London-based company, 0 = otherwise
BUSY	indicator variable, 1 = December 31st or March 31st year-end, 0 = otherwise
LOSS	indicator variable, 1 = loss in any of the past three years, 0 = otherwise
INITIAL	indicator variable, 1 = new auditor in the current or prior year, 0 = otherwise;
INSOWN	proportion of ordinary shares held by institutional shareholders who individually owns 5 percent or more of outstanding ordinary shares
Dependent variables for earnings quality analysis	
DAC_PERF	magnitude and direction of discretionary accruals model by Kothari *et al*., (2005) which controls for firm's performance
AEE	accrual estimation error (AEE) based on the Dechow and Dichev's modified accrual quality model by McNichols (2002)
PROFIT	indicator variable, 1 = reported positive net income before extraordinary item, 0 = otherwise
Control variables for earnings quality model	
LTA	natural log of total assets in GBP'000
DE	ratio of long-term debt to total assets
PYTAC	net income from continuing operations minus operating cash flow in year t-1 scaled by total assets at

	year t-2
GROWTH	one-year growth rate in sales
MB	the market value of equity divided by book value of equity
CFO	operating cash flow in year t scaled by total assets at year t-1
ALTMAN	Altman's (1983) scores
BLOCKOWN	proportion of ordinary shares held by institutional blockholders who individually owns 3 percent or more of outstanding ordinary shares
BIG4	indicator variable, 1 = client Big 4 audit firms, 0 = otherwise
SECOND	indicator variable, 1 = client of Second-tier audit firms, 0=otherwise
TAC	net income from continuing operations minus operating cash flow in year t scaled by total assets at year t-1
LAG_LOSS	indicator variable, 1 = loss in the prior year, 0=otherwise
ε	error term

5.8 Data diagnostic test

In this section, the data diagnostic test is employed on the data examined in the study. This is to ensure that the data passed the criteria of the parametric test, which are the normality, linearity, multicollinearity, heteroscedasticity and autocorrelation assumptions. Any violation of the assumptions will caused the inferences made on the estimates from the OLS to be statistically inefficient or invalid (Gujarati, 2003; Greene, 2008).

Gujarati (2003) and Hair *et al*. (2010) list down the five fundamental assumptions underlying a valid OLS. The assumptions that are needed to be fulfilled by the data in order for the OLS results to be valid are; 1) normality (where the errors or residuals should follow a normal distribution; 2) linearity (where the dependent and independent variables have a linear relationship), 3) homoscedasticity (where there is constant errors variance), 4) independent error term (error of one observation could not be correlated with error of another observation), and 5) multicollinearity (no exact collinearity between predictors) .

Next, few statistical analysis will be employed on the data to test the all the five assumptions mentioned above. Each of these assumptions is tested using various statistical analyses available in the STATA statistical tool, and the next five sub-sections outline the results and discussions. The same data diagnostic test is performed for each of the model specifications that are used in the study; which is the audit fees model (hereafter referred to as the *LAF* model) and the three earnings quality models (hereafter referred to as (the *DAC_PERF* model, the *AEE* model and the *PROFIT* model). The results are discussed below in the respective sections.

5.8.1 Assumption of normality

As discussed above, the first assumption underlying the OLS regression is that the data from the population is normally distributed. As shown in the skewness and kurtosis columns in Table 5.9 for the variables examined in this study, most of the variables are not normally distributed. The normal distribution takes a value of 0, and values above and below 0 denote departures from normality. To reach the normal distribution, following prior audit fees studies, variables *AF*, *NAF*, *SUBS* and *TA* have been transformed using the natural log and the square root (e.g. *LAF*, *LNAF*, *SQRTSUBS*, *LTA*). Whereas all the corporate governance variables including the institutional ownership variable has been transform to normal scores using the Van der Waerden's Formula. This transformation technique was used in previously published studies on corporate governance (Cooke, 1998; Haniffa and Cooke, 2002; Al-Baluchi, 2006; Mangena and Tauringana, 2007).

Besides that, the residuals of the regression model should be normally and randomly distributed with a mean of zero. According to Chen *et al*. (2003), the normality assumption could be examined using graphic test or numerical tests, in which both will be used in this section. For the graphic tests, the study shall employ the normal probability plot and the Kernel density estimate. Whereas for the numerical test, the study employs the Shapiro-Wilk test (Swilk test), which is claimed by Chen *et al*., (2003), as a very highly reliable numerical test to detect a small departure from normality.

The graphs for the Kernel density estimate for the *LAF* model, *DAC_PERF* model, *AEE* model and *PROFIT* model are presented in Figure 5.1, Figure 5.2, Figure 5.3 and Figure 5.4 respectively. For the residuals for each these models to be considered normal, the kernel density estimate line of the respective residuals should be overlaid on the normal density line in the graph. Except for the *LAF* model in Figure 5.1, all the results for the *DAC_PERF* model, *AEE* model and *PROFIT* model indicated that the residuals in the model are not normally distributed as demonstrated by their departure from the normal density line. Only the kernel density estimate line for the *LAF* model is nicely overlaid on the kernel plot. Next, the standardized normal probability plot test the sensitivity to non-normality in the middle range of the residuals data. Except for the *LAF* model in Figure 5.5, the results of the standardized normal probability plot test (P-P plot) in Figure 5.6, Figure 5.7 and Figure 5.8 for the *DAC_PERF* model, *AEE* model and *PROFIT* model respectively, seems to deviate significantly from the normal plot.

Next, the normality of the residuals is further tested using a numerical test, which is the Swilk Test. The null hypothesis of the Swilk Test is that the residuals are normally distributed. Thus, if the *p*-value is significant, then the null hypothesis would be rejected, as the results suggest the residuals are not normally distributed. Table 5.10 presents the results of the Swilk Test for all the four models examined in this study. It can be seen from the last right column of Table 5.10 that all the p-values are significant for all of the four models, suggesting that the normality of residuals are not fulfilled at one percent significant level since the *p*-value is less than 0.01. Thus, the null hypothesis is rejected, and it can be concluded that the data in the study is not normally distributed. Taken together, both the results of the graphic test and the numerical test suggest that the data used in the study is not normally distributed.

Table 5.9: Kurtosis and skewness for the variables in the *LAF* model

	Mean	Median	Standard Deviation	Kurtosis	Skewness	Min	Max
AF (‘000)	1,163	279	3,281	64.222	7.279	9	37,234
NAF (‘000)	645	155	1,473	35.658	5.241	0	15,859
BODFEM	0.067	0.000	0.093	0.957	1.257	0.000	0.429
BODFOREIGN	0.149	0.000	0.219	2.649	1.753	0.000	1.000
ACSIZE	3.269	3.000	0.926	0.295	0.633	2.000	7.000
ACINDP	0.961	1.000	0.134	15.538	-3.824	0.000	1.000
ACFINEXP	0.351	0.330	0.194	-0.034	0.589	0.000	1.000
ACMEET	3.448	3.000	1.456	9.607	1.848	1.000	15.000
INTAUD	0.689	1.000	0.463	-1.330	-0.820	0.000	1.000
INSOWN	2.919	3.000	1.626	-0.424	0.211	0.000	8.000
TA (‘000)	4,400,433	367,423	18,397,799	79.530	8.437	1,227	214,818,000
SUBS	15.870	10.000	19.361	32.594	4.457	0.000	210.000
FOREIGN	0.344	0.089	0.402	-1.410	0.592	0.000	1.000
OPINION	0.058	0.000	0.234	12.291	3.777	0.000	1.000
ROI	0.028	0.045	0.232	35.061	1.825	-1.126	2.609
DE	0.152	0.112	0.171	6.221	1.794	0.000	1.427
QUICK	1.829	0.938	3.831	60.437	6.872	0.014	49.078
CATA	0.430	0.411	0.232	-0.521	0.373	0.004	1.000
LONDON	0.400	0.000	0.490	-1.838	0.408	0.000	1.000
BUSY	0.655	1.000	0.476	-1.579	-0.652	0.000	1.000
LOSS	0.187	0.000	0.390	0.582	1.606	0.000	1.000
INITIAL	0.140	0.000	0.347	2.319	2.077	0.000	1.000

(Note: All continuous variables have been winsorised at top and bottom 1%)

Refer Table 5.8 for definition of variables.

Figure 5.1: Kernel density test for the *LAF* model

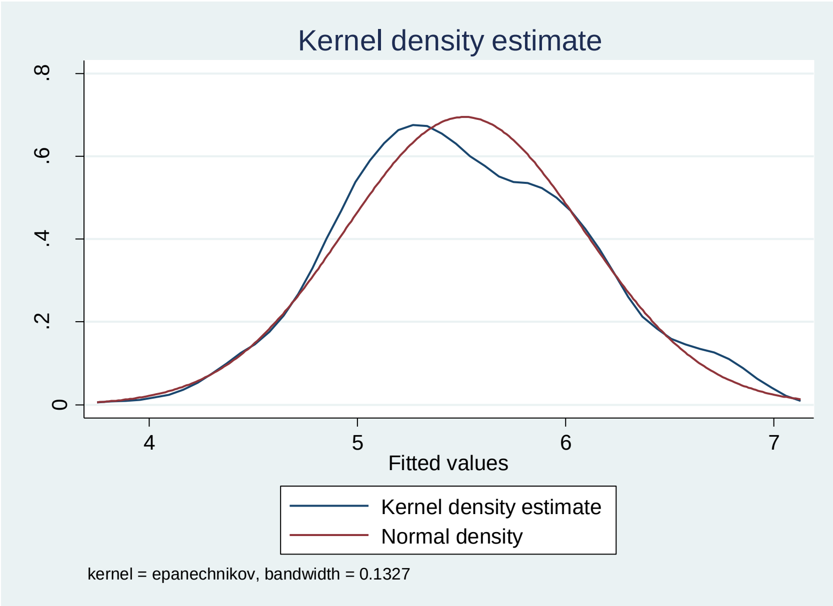


Figure 5.2: Kernel density test for the *DAC_PERF* model

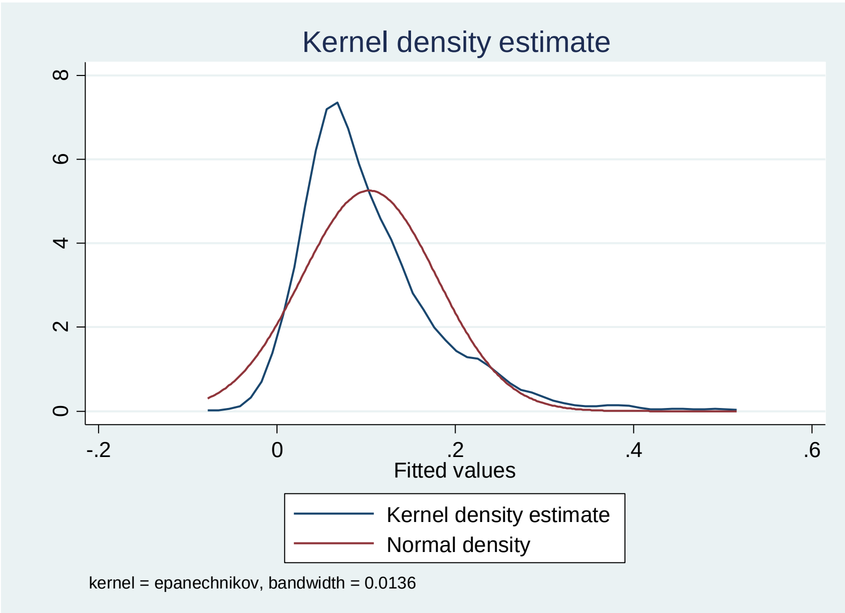


Figure 5.3: Kernel density test for the *AEE* model

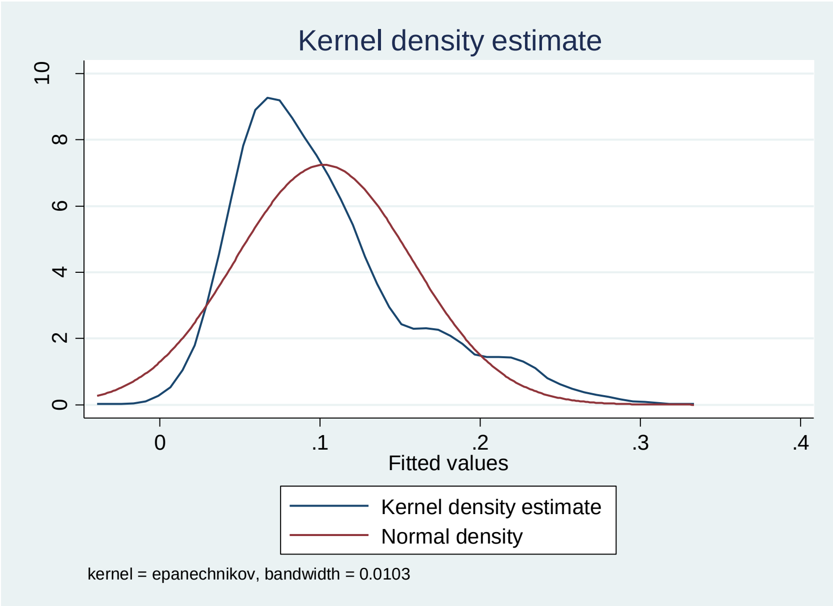


Figure 5.4: Kernel density test for the *PROFIT* model

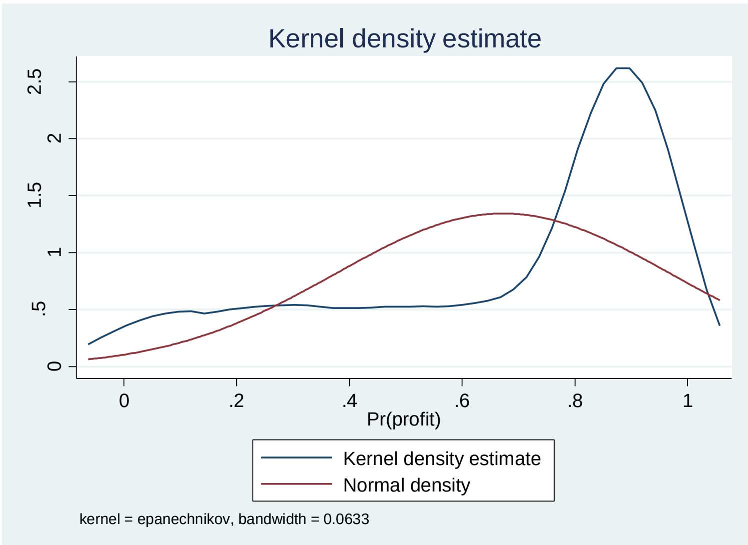


Figure 5.5: Standardized normal probability plot (P-P plot) test for the *LAF* model

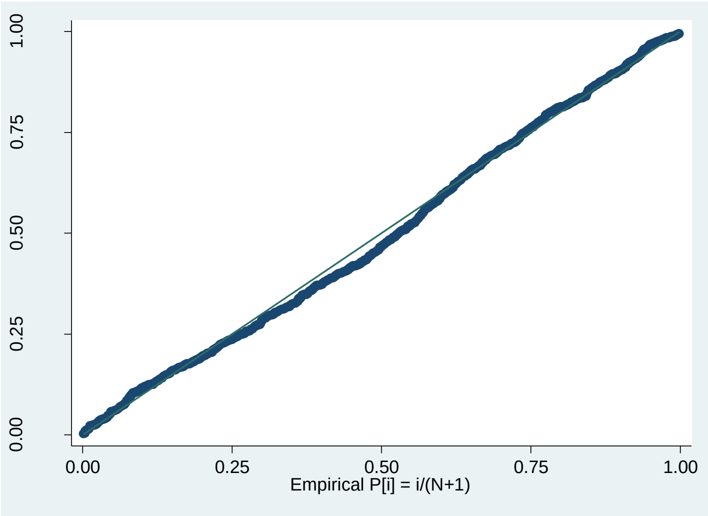


Figure 5.6: Standardized normal probability plot (P-P plot) test for the *DAC_PERF* model

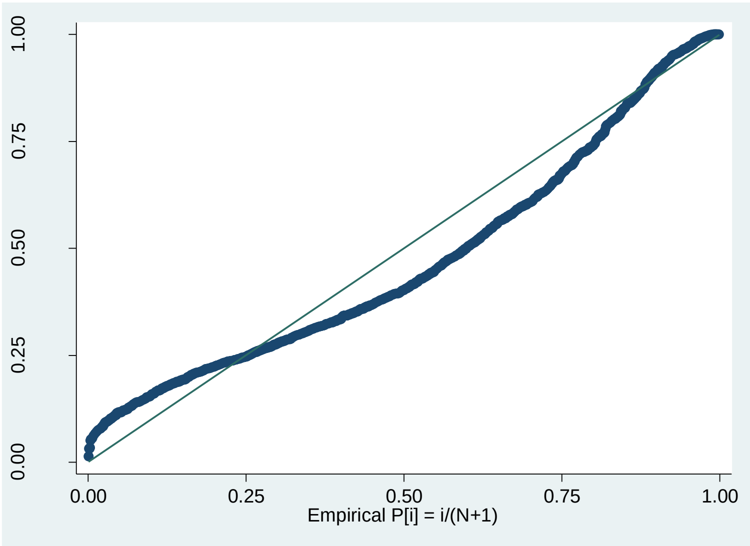


Figure 5.7: Standardized normal probability plot (P-P plot) test for the *AEE* model

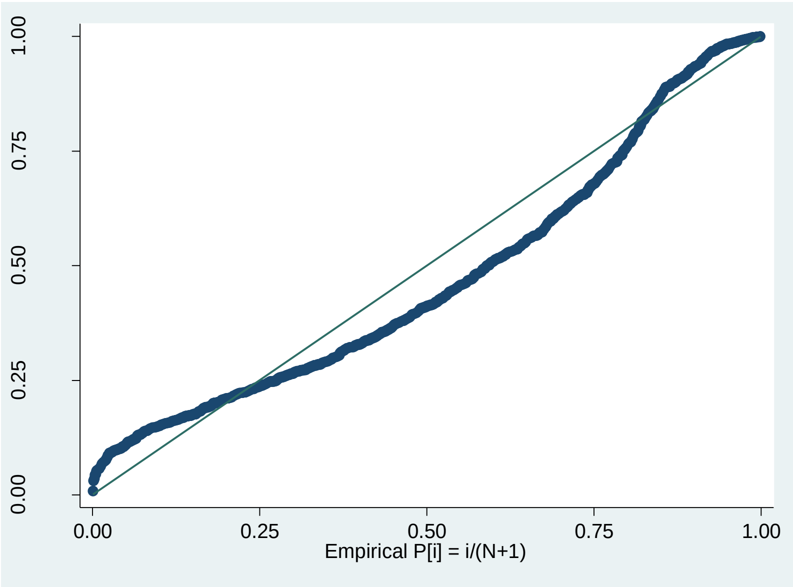


Figure 5.8: Standardized normal probability plot (P-P plot) test for the *PROFIT* model

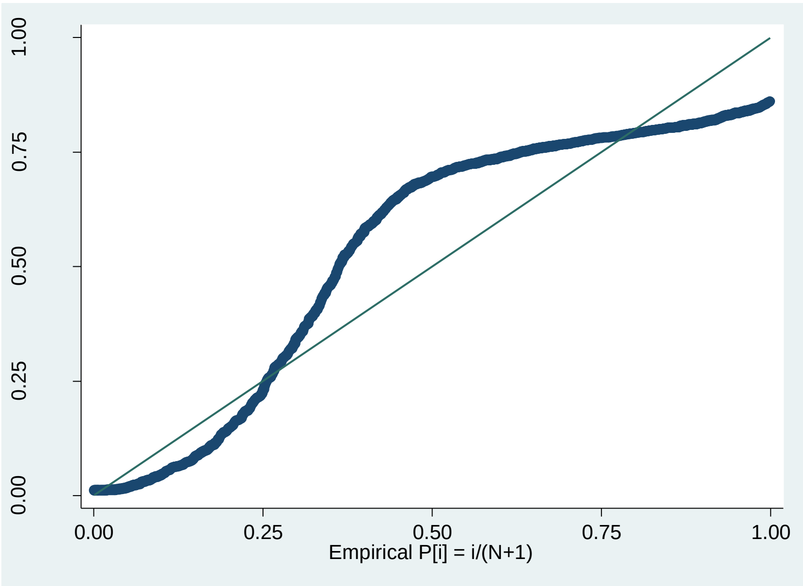


Table 5.10: Shapiro-wilk (Swilk) test of the residuals

Models	Observation	W	V	z	Prob>z
LAF Model	892	0.99109	5.062	3.997	0.00003
DAC_PERF Model	1,038	0.92840	59.279	10.231	0.00000
AEE Model	1,347	0.83896	133.332	12.262	0.00000
PROFIT Model	1,347	0.90376	79.686	10.972	0.00000

5.8.2 Assumption of linearity

Under this assumption, the OLS model is expected to have linear parameters where the relationship between dependent and independent variables follows a straight line. Augmented component plus residual plot for non-dummy independent variables is used to check on the linearity assumption, where the standardised residuals are plotted against each of the independent variables in the regression model and the graph will indicate whether a linear pattern exists between the variables. Figure 5.9 to Figure 5.11 presents the augmented component plus residual plot for *LNAF*, *PYTAC* and *MB* from the respective models, which demonstrated that the data points are asymmetrically scattered from the ordinary regression line in the plot with serious outliers. Thus, it can be concluded that the linearity assumption in the relationship between the response variables and predictors is not fulfilled.

Figure 5.9: The augmented component plus residual plot for *LNAF* from the *LAF* model

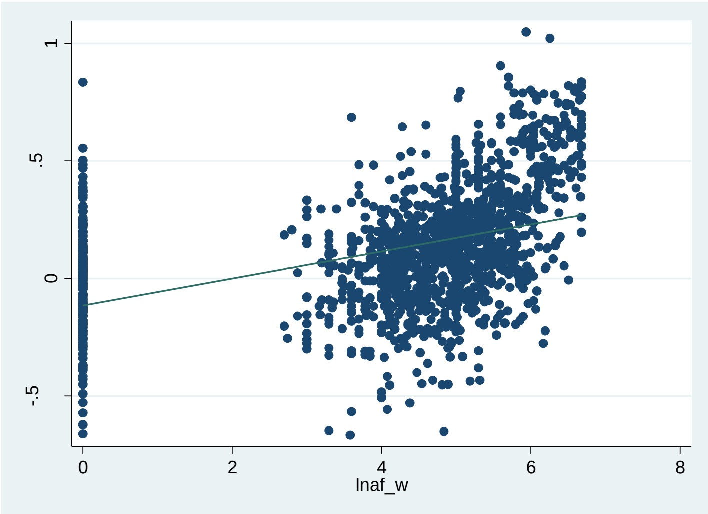


Figure 5.10 : The augmented component plus residual plot for *PYTAC* from the *DAC_PERF* model

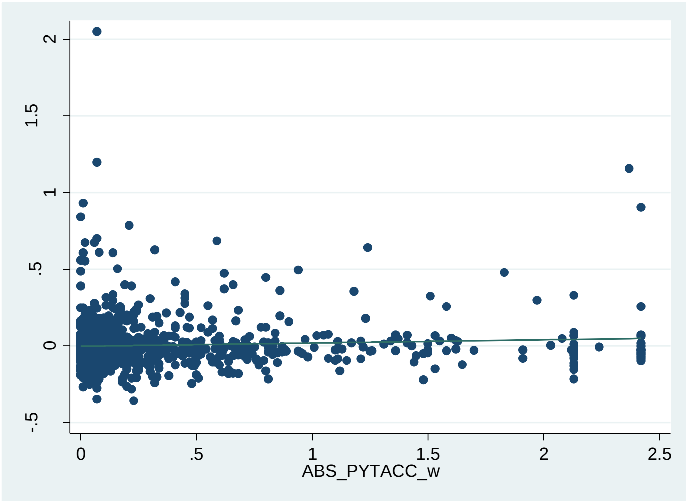
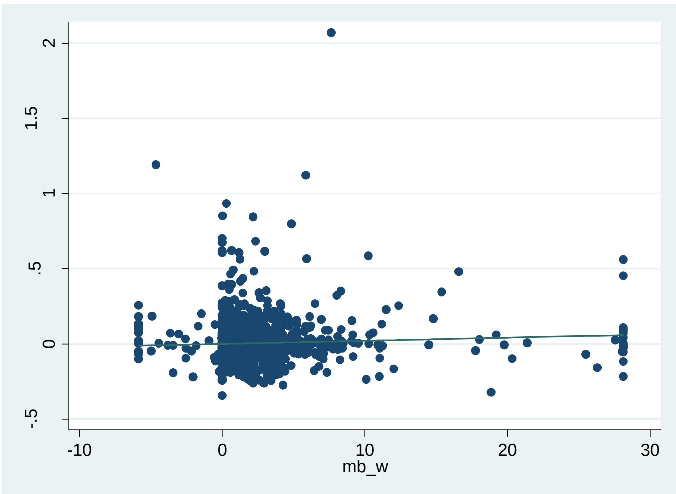


Figure 5.11: The augmented component plus residual plot for *MB* from the *DAC_PERF* model



5.8.3 Assumption of homoscedasticity

Another important assumption in the *OLS* regression is that the standard deviation (or variance) of error terms is constant or homogeneous, or in other words, the error terms all have the same variance (Gujarati, 2003). The case of unequal variance is termed as heteroscedasticity, and it could be caused by outliers and skewness in the distribution of one or more regressors present in the model. The presence of heteroscedasticity hinders the *OLS* regression from producing efficient estimates (Gujarati, 2003). Following Chen *et al*., (2003) and Baum (2006), the present study uses the Breush-Pagan or Cook-Weisberg test to check for heteroscedasticity. If the p-value is significant, then the null hypothesis that the variance of the residuals is constant would be rejected, suggesting the presence of heteroscedasticity. Meanwhile, in Breusch-Pagan/ Cook Weisberg test, a large chi-square value plus significant *p*-value of chi-square would indicate the present of heteroscedasticity. Results of the Breusch-Pagan/ Cook Weisberg test for each of the *LAF* model, *DAC_PERF* model, *AEE* model and the *PROFIT* model are presented in Table 5.11 below. Results indicate that only the p-value for the *LAF* model is insignificant (p>0.10), suggesting that the variance of the error terms for the model is constant or homogeneous. However, the p-values for the *DAC_PERF* and *AEE* are significant (p<0.01), suggesting that the models' error term suffer from heteroscedasticity problem.

Table 5.11: Breusch-Pagan / Cook-Weisberg test for heteroskedasticity

Model	**Results**
LAF Model	chi2(1) = 0.01, Prob > chi2 = 0.9264
DAC_PERF Model	chi2(1) = 2306.00, Prob > chi2 = 0.0000
AEE Model	chi2(1) = 1487.36, Prob > chi2 = 0.0000

5.8.4 Assumption of no autocorrelation (independent error terms)

Next, this section test for the assumption of no correlation in OLS is met. While the OLS assumes that the error terms are independent, autocorrelation (serial correlation) happens when the error term of one period done is correlated with the error term of the previous period. This non-independent error term biases the standard errors and causes the results of the OLS to be less efficient (Drukker, 2003). The Wooldridge (2002) is a new and attractive test for serial correlation for panel data (Drukker, 2003).

If the p-value is significant, then the null hypothesis is rejected, suggesting the error term is not independent. Results of the Wooldridge test for each of the *LAF* model, *DAC_PERF* model, *AEE* model and the *PROFIT* model are presented in Table 5.12 below. Except for the *AEE* model, the results indicate that the p-values for the *LAF* model, *DAC_PERF* model and *AEE* model are significant. 0.010, suggesting that the assumption of no autocorrelation is not fulfilled.

Table 5.12: Wooldridge test for autocorrelation in panel data

Model	**Results**
LAF Model	F(1, 197) = 30.468, Prob > F = 0.0000
DAC_PERF Model	F(1, 303) = 5.528, Prob > F = 0.0194
AEE Model	F(1, 238) = 0.002, Prob > F = 0.9680
PROFIT Model	F(1, 304) = 48.062, Prob > F = 0.0000

5.8.5 Assumption of no multicollinearity

Finally, in this section, the study further investigate whether the models fulfils the assumptions of no multicollinearity. This is done by calculating the variance inflation factor (*VIF*) and conducting a tolerance value test. As a rule of thumb, *VIF* value for a variable exceeding 10 or tolerance value (1/*VIF*) below 0.10, indicates high collinearity (Gujarati, 2003). The results are presented in Table 5.13 below for the *LAF* model, and Table 5.14 for the two earnings quality models; *DAC_PERF* model and the *AEE* model. Since all the variables have *VIF* values that are just between 1 and 2, whereas tolerance values that are higher than 0.10 this suggests that no multicollinearity problem exists.

Table 5.13: VIF and tolerance value for *LAF* model

Variable	VIF	Tolerance value
LNAF	1.4	0.712
LTA	4.0	0.250
SQRTSUBS	1.43	0.699
ROI	1.63	0.614
DE	1.72	0.580
FOREIGN	1.32	0.760
QUICK	1.32	0.756
CATA	1.84	0.542
OPINION	1.33	0.751
LONDON	1.26	0.791
BUSY	1.21	0.825
LOSS	1.80	0.554
INITIAL	1.13	0.883
INSOWN	1.16	0.862
JOINT_NAT#1-CITY#1	2.02	0.496
CITY#1_ONLY	1.91	0.522
NAT#1_ONLY	1.11	0.899
BODFEM	1.34	0.747
BODFOREIGN	1.52	0.659
INTAUD	2.12	0.471
ACSIZE	1.64	0.610
ACINDP	1.16	0.860
ACFINEXP	1.19	0.842
ACMEET	1.66	0.601
MEAN VIF	**1.59**	

Table 5.14: VIF and tolerance value for *DAC_PERF* model and *AEE* model

	***DAC_PERF* Model**			***AEE* Model**	
Variable	**VIF**	**Tolerance value**		**VIF**	**Tolerance value**
LTA	4.360	0.230		4.170	0.240
PYTAC	1.290	0.774		1.330	0.749
DE	1.490	0.672		1.470	0.682
GROWTH	1.060	0.940		1.110	0.904
MB	1.060	0.941		1.100	0.910
CFO	1.620	0.616		1.490	0.673
LOSS	1.730	0.577		1.610	0.620
ALTMAN	1.440	0.695		1.460	0.686
BLOCKOWN	1.220	0.821		1.280	0.780
BIG4	3.870	0.258		3.640	0.275
SECOND	1.940	0.515		2.430	0.411
BODFEM	1.270	0.785		1.280	0.781
BODFOREIGN	1.300	0.768		1.290	0.773
INTAUD	2.310	0.434		2.160	0.463
ACSIZE	1.660	0.603		1.660	0.604
ACINDP	1.130	0.888		1.140	0.878
ACFINEXP	1.130	0.885		1.170	0.858
ACMEET	1.680	0.594		1.750	0.572
JOINT_NAT#1-CITY#1	1.970	0.508		1.470	0.682
CITY#1_ONLY	1.250	0.798		1.280	0.780
NAT#1_ONLY	1.700	0.587		1.130	0.882
Mean VIF	**1.610**			**1.580**	

5.9 Mitigating outliers

Following Cornett *et al*. (2008) and Dhaliwal *et al.* (2009), all the continuous variables are winsorised at the top 1 percent and bottom 1 percent, as to mitigate the effect of extreme outliers in the dataset. In addition, a numerical test called the inter-quartile range (IQR) test is also performed to determine the presence of extreme outliers. The results of the IQR are presented in Table 5.15, Table 5.16, Table 5.17 and Table 5.18 for the *LAF* model, the *DAC_PERF* model, the *AEE* model and the *PROFIT* model respectively. Any points which are either 3 inter-quartile-ranges below the first quartile or 3 inter-quartile-ranges above the third quartile, indicates severe outliers. Based on the results in Table 5.15 to Table 5.18, no evidence of severe outliers has been documented.

Table 5.15: Inter-quartile range test for *LAF* model

mean=	5.513	std.dev.= .5782	(n= 892)	
median=	5.473	pseudo std.dev.= .607	(IQR=0.8188)	
10 trim=	5.5			
			low	high
		inner fences	3.882	7.157
		# mild outliers	0	0
		% mild outliers	0.00%	0.00%
		outer fences	2.653	8.385
		# severe outliers	0	0
		% severe outliers	0.00%	0.00%

Table 5.16: Inter-quartile range test for *DAC_PERF* model

mean=0.672	std.dev.= .2987	(n=1347)	
median=0.8212	pseudo std.dev.= .3371	(IQR=.4547)	
10 trim=0.7114			
		low	high
	inner fences	-0.2319	1.587
	# mild outliers	0.00%	0.00%
	% mild outliers	0.00%	0.00%
	outer fences	-0.914	2.269
	# severe outliers	0.00%	0.00%
	% severe outliers	0.00%	0.00%

Table 5.17: Inter-quartile range test for *AEE* model

mean= 0.1023	std.dev.= .0551	(n=1,083)	
median= 0 .09	pseudo std.dev.= .0481	(IQR=0.0649)	
10 trim= .096			
		low	high
	inner fences	-0.0346	0.2252
	# mild outliers	0	49
	% mild outliers	0.00%	3.64%
	outer fences	-0.132	0.3226
	# severe outliers	0	1
	% severe outliers	0.00%	0.07%

Table 5.18: Inter-quartile range test for *PROFIT* model

mean=	0.672	std.dev.=	0.2987	(n=1,347)		
median=	0.8212	pseudo std.dev.=	0.3371	(IQR=0.4547)		
10 trim=	0.7114					
					low	High
		inner fences			-0.2319	1.587
		# mild outliers			0	0
		% mild outliers			0.00%	0.00%
		outer fences			-0.914	2.269
		# severe outliers			0	0
		% severe outliers			0.00%	0.00%

5.10 Alternative regression estimators to the OLS regression

Given that the data diagnostic test above indicates that most of the standard OLS regression assumptions have been violated, it is important that the study employs alternative methods of regression. This is because violation of the parametric assumptions of the OLS regression leads to incorrect estimates of coefficients and standard errors (Baltagi, 2005; Greene, 2008; Gujarati and Porter, 2009). Hamilton (1992) suggested the use of robust regression as an alternative to OLS in case of the assumptions are violated, and that it has a more efficient statistical properties and more accurate confidence intervals and tests then the OLS.

Thus, in the main analysis, the study employs the Huber White (1980) robust standard errors to correct for heteroscedasticity, non-normality and outliers (Chen *et al*., 2003). In addition, as the study uses a panel data (repeated observations on the same, or a substantially overlapping, set of firms over time) (Gow *et al*., 2010), there is a possibility that cross sectional and time-series dependence are present given that the residuals may be correlated across firms or across time (Petersen, 2009). While the OLS regression estimator with Huber White (1980) robust standard errors are consistent in the presence of heteroscedasticity, it has been argued that it could be biased or produces mis-specified test-statistics (either over or underestimate the true variability of the coefficient estimates) when either form of dependence is present, such as in panel dataset (Gow *et al*., 2010, p.487). According to Petersen (2009) and Gow *et al*. (2010), the use of White (1980) robust standard error fail to correct for both cross-sectional and time-series dependence in panel data, thus produces mis-specified test-statistics and invalid inferences about the relationship of the variables examined. In other words, the audit quality and earnings quality of the companies could be correlated within a client over time, within a period across clients, or in both ways.

Thus, a sensitivity analysis is performed in Chapter 8.2 and Chapter 11.2 for the audit quality and earnings quality analysis respectively, where all the regressions performed in the main analysis are re-estimated using i) one-way cluster robust standard error, clustering for the firm dimension, and ii) two-way cluster robust standard error, clustering for both the firm and time dimensions.

5.11 Summary

This chapter describes the study. The model specification and the sampling and data collection process, and the sources of data used for the study. The independent and dependent variables have also been clarified, with a clear demonstration of the empirical models to examine the research questions. There are four models altogether, namely the *LAF* model, *DAC_PERF* model, *AEE* model and *PROFIT* model. Diagnostic test is performed at the final part of the chapter to check whether the OLS assumptions have been violated. Given the results of the diagnostic test indicates that the five *OLS* assumptions were not fulfilled, alternative regression estimates have been considered, which includes the used of Huber White (1980) robust standard error in the main analysis. In addition, one-way and two-cluster robust standard error as recommended by Gow *et al*. (2010) and Petersen (2009) will be used in the sensitivity analysis to confirm the robustness of the study findings.

CHAPTER 6

DESCRIPTIVE STATISTICS: THE EFFECT OF INDUSTRY SPECIALIST AUDITORS AND CORPORATE GOVERNANCE ON AUDIT QUALITY

6.1 Introduction

This chapter begins by outlining the descriptive statistics of the variables employed in the first empirical analysis investigating the effect of industry specialist auditors and corporate governance on audit quality, as proxy by the variation in the level of audit fees. The next section in this chapter presents the descriptive statistics for the sample used in the study. The sample selection process has been discussed in detail earlier in Chapter 5, together with the empirical models and variables that are to be examined in the study. This is followed by a pairwise correlation matrix which identifies the significant associations among the independent variables examined in this study.

6.2 Descriptive statistics

Table 6.1 contains descriptive statistics for the variables used in first empirical analysis investigating the effect of industry specialist auditors and corporate governance on audit fees. The descriptive statistics in the table below refer to the period 2008-2011 and only for the Big 4 sample. There are 892 listed companies in this period that are audited by the Big 4 audit firms. The sample selection process on how the Big 4 sample is derived is presented in Table 5.1 in the previous chapter. Only the Big 4 sample is used for this first empirical study as the study intends to examine the effect of the Big 4 industry specialist auditor's differential fee premium relative to other Big 4 audit firms who are non-industry leaders.

The mean audit fee (*AF*) and natural logarithm of audit fees (*LAF*) in this period is £1.163 million and 5.519 respectively. These means, respectively, is lower as compared to prior audit fees studies in the U.K. by Adelopo *et al*. (2012) of £1.6 million. However, this figure is higher relative to Zaman *et al*. (2011) which reported mean of £202,489 and Basioudis and Francis (2007) who documented the natural logarithm of audit fees in their study to be 4.540. The difference is primarily driven by the larger sample size used in this study. The sample size for studies by Adelopo *et al*. (2012) is 209 observations, Zaman *et al*. (2011) is 155 observations, whereas Basioudis and Francis (2007) examined only 631 observations of Big 4 companies during their sample period.

In relation to the board diversity variables, there is on average 6.7 percent female directors (*BODFEM*) sitting on the corporate board of the public listed companies in the sample. This figure shows a great progress in the woman participation in the U.K. board given that it was only 0.5 percent in 2002 (Brammer *et al.*, 2007). The improvement in the female directors composition in the U.K.

corporate boards indicates the success of the U.K. government's effort to promote gender diversity on board through the establishment of Lord Davies of Abersoch Steering Committee's to review on the issue and make recommendations regarding what government and business could do to increase the proportion of women on corporate boards (Davies Review Annual Report, 2011). The average foreign directors (*BODFOREIGN*) on the U.K. corporate board during the sample period is 14.9 percent. The average female directors and foreign directors on board reported in this study (6.7 percent and 14.9 percent respectively) are slightly are lower as compared 10 percent (average female directorship) and 18 percent (average foreign directorship) reported by Garcia-Meca *et al*. (2015) in their study covering nine countries including the U.K. The average female directors on board reported in this study (6.7 percent) is also lower as compared to the U.S. which is reported at the average of 9.4 percent (Srinidhi *et al*., 2011).

Audit committees on the U.K. boards (*ACSIZE*) have, on average, 3 members. 96.1 percent of audit committee members are comprised only of independent non-executive directors (*ACINDP*). This finding suggest vast improvement in the audit committee independence level as a prior U.K. study by Zaman *et al*. (2011) has only reported the average audit committee independence to be 53 percent between 2001 and 2005. On average, 35.1 percent of the audit committee composition is represented by directors having accounting or financial expertise (*ACFINEXP*). Audit committees in this study meet on average 3 times during the year. The average meeting frequency of audit committees (*ACMEET*) is 3 times, which is comparable to Zaman *et al*. (2011), but slightly lower as compared to Adelopo *et al*. (2012) who have documented their average meeting frequency to be 4 times a year. Finally, 68.9 percent of the U.K. public listed companies have their own internal audit function (*INTAUD*), comparable with 60 percent reported by Hay *et al*. (2008) in Australia.

Of the other audit fee determinants, the average company size based on total assets (*TA*) is £4,400 billion; firms have on average 16 subsidiaries (*SUBS*) with an average 34.4 percent foreign sales (*FOREIGN*); only 5.8 percent of the companies in the sample on average over the period 2008 to 2011 have received either a qualified or going concern audit opinion (*OPINION*); the mean ROI of firms is 2.8 per cent and the gearing levels (*DE*) are on average 15.2 per cent. The mean for the quick ratio (*QUICK*) is 1.829, the mean for ratio of current asset to total assets (*CATA*) is 0.43; 18.7 percent of the companies experienced loss in the preceding three years and 14 percent of companies have just changed their auditor within the preceding two years. 40 per cent of the listed companies in the sample are located in London (*LONDON*) and 65.5 per cent of the companies' year end falls on December 31st or March 31st year-end (*BUSY*), which is also regarded as the audit peak period. The average number of institutional shareholders with more than 5 percent shareholdings in the company (*INSOWN*) is 2.919, which is lower as compared to 5.81 reported in Zaman *et al*. (2011).

Table 6.1: Descriptive statistics for the *LAF* model (N=892)

Variables	Mean	Median	Standard	Min	Max
AF ('000)	1,163	279	3,281	9	37,234
LAF	5.519	5.446	0.632	3.954	7.571
NAF ('000)	645	155	1,473	0	15,859
LNAF	4.907	5.192	1.541	0.000	7.200
BODFEM	0.067	0.000	0.093	0.000	0.429
BODFOREIGN	0.149	0.000	0.219	0.000	1.000
ACSIZE	3.269	3.000	0.926	2.000	7.000
ACINDP	0.961	1.000	0.134	0.000	1.000
ACFINEXP	0.351	0.330	0.194	0.000	1.000
ACMEET	3.448	3.000	1.456	1.000	15.000
INTAUD	0.689	1.000	0.463	0.000	1.000
INSOWN	2.919	3.000	1.626	0.000	8.000
TA ('000)	4,400,433	367,423	18,397,799	1,227	214,818,000
LTA	8.627	8.565	0.937	6.089	11.332
SUBS	15.870	10.000	19.361	0.000	210.000
SQSUBS	3.471	3.160	1.957	0.000	14.490
FOREIGN	0.344	0.089	0.402	0.000	1.000
OPINION	0.058	0.000	0.234	0.000	1.000
ROI	0.028	0.045	0.232	-1.126	2.609
DE	0.152	0.112	0.171	0.000	1.427
QUICK	1.829	0.938	3.831	0.014	49.078
CATA	0.430	0.411	0.232	0.004	1.000
LONDON	0.400	0.000	0.490	0.000	1.000
BUSY	0.655	1.000	0.476	0.000	1.000
LOSS	0.187	0.000	0.390	0.000	1.000
INITIAL	0.140	0.000	0.347	0.000	1.000

(Note: All continuous variables have been winsorised at top and bottom 1 percent)

Refer Table 5.8 for definition of variables

Next, the study presents the descriptive statistics for the Big 4 audit firms and the industry specialist auditors' market share respectively. For completeness, the market share of the Big 4 audit firms and the industry specialist auditors are calculated on all the observations in the sample with available audit fees data (N=1,747), as indicated in sample selection process in Table 5.1 earlier.

Panel A of Table 6.2 presents the sample distribution of the audit firms based on number of clients, while Panel B presents the sample distribution of the audit firms based on audit fees. The findings below reports that Big 4 auditors have performed, on average, over the period 2008 to 2011, 64 percent of audits in the sample (first line in Panel A) and received about 96 percent of audit fees (first line in Panel B). Further in Panel B of Table 6.2, it can be seen that PricewaterhouseCoopers (PWC) is the leading firm auditing about 20 percent of clients and earning on average 48 percent of audit fees in the sample. KPMG (KP) ranked second in term of number of audit clients (approximately 18 percent) whereas Ernst & Young (EY) ranked the second in term of market share of audit fees (about 20 percent). The three mid-tier auditors, BDO International (BDO), Grant Thornton (GT) and Baker Tilly (BA) together have conducted 19 percent of audits in the sample and received approximately 3 percent of audit fees. Whereas about 43 third-tier firms have audited about 17 percent of the sample firms and received about 1 percent of audit fees.

Table 6.2: Sample distribution of audit firms

Panel A: Sample distribution of the audit firms based on number of clients (N=1,747)										
	2008		**2009**		**2010**		**2011**		**Average**	
	N	**%**	**N**	**%**	**N**	**%**	**N**	**%**	**N**	**%**
Big4	261	63	274	65	285	63	295	64	279	64
Second Tier	83	20	81	19	85	19	88	19	84	19
Third Tier	68	17	67	16	79	18	81	17	74	17
TOTAL	412	100	422	100	449	100	464	100	437	100
PWC	76	19	87	20	94	21	95	21	88	20
KP	71	17	73	18	81	18	84	18	77	18
DE	68	16	70	17	66	14	72	16	69	16
EY	46	11	44	10	44	10	44	9	45	10
GT	43	10	40	10	39	9	40	8	41	9
BDO	26	7	29	7	34	7	36	8	31	7
BA	14	3	12	2	12	3	12	3	13	3

Panel B: Sample distribution of the audit firms based on percentage of audit fees in GBP'000 (N=1,747)					
	2008	**2009**	**2010**	**2011**	**Average**
	%	**%**	**%**	**%**	**%**
Big4	96	96	96	97	96
Second Tier	3	3	3	2	3
Third Tier	1	1	1	1	1
TOTAL	100	100	100	100	100
PWC	45	50	48	48	48
EY	22	18	21	19	20
DE	15	14	13	14	14
KP	14	14	15	15	15
GT	2	2	1	1	2
BDO	0.7	0.7	0.8	0.7	0.7
BA	0.3	0.3	0.2	0.3	0.3

[a] Second-tier firms are GT, BDO and BA.
[b] There are 43 small third-tier firms in the sample.
[C] Definition of Big 4 and Second-Tier Accounting Firms:
PWC = PricewaterhouseCoopers
EY = Ernst & Young
DE = Deloitte & Touche
KP = KPMG
GT = Grant Thornton
BDO = BDO International
BA= Baker Tilly

Table 6.3 below reports the sample distribution based on the 13 industry codes used in the study. The industry codes used are based on the FAME categorisation of major industry sectors, where the numerous LSE industry codes (SIC codes) of similar industry nature are being categorised into only 13 major industry sectors. The industry sector that seems to be paying the most fees as an average figure are the primary sector (22.95 percent), followed by the wholesale (13.07 percent) and the chemicals industry (11.84 percent). Subtle differences in the market share of audit fees can be observed for the food sector and also the publishing sector during the four years period examined in the study where their industry market have increased 7 times subsequent to 2008.

Table 6.3: Industry distribution based on audit fees in GBP'000 (N=1,747)

Major industry sectors	2 Digit SIC Codes	2008 (%)	2009 (%)	2010 (%)	2011 (%)	Average (%)
Primary Sector (agriculture, mining, etc.)	1,10-14,23	23.13	23.35	25.06	20.27	22.95
Chemicals, rubber, plastics, non-metallic products	24-26	12.92	11.82	11.52	11.09	11.84
Construction	45	4.97	4.76	4.43	4.13	4.57
Food, beverages, tobacco	15-16	1.03	7.03	6.43	6.19	5.18
Gas, water, electricity	40-41	2.02	3.10	2.52	2.64	2.57
Hotels and restaurants	55	2.74	2.83	2.66	2.84	2.77
Machinery, equipment, furniture, recycling	30,33-37	6.97	7.59	7.59	7.59	7.43
Metals and metal products	27-29	7.35	6.99	7.28	12.24	8.46
Post and telecommunications	64	5.46	5.35	5.06	4.96	5.21
Publishing, printing wood, cork, paper,	20-22	1.30	7.28	7.30	7.54	5.86
Textiles, wearing apparel, leather	17-19	1.54	1.48	1.41	1.54	1.49
Transport	60-63	6.08	5.81	5.48	5.05	5.60
Wholesale and retail trade	50-52	12.49	12.61	13.26	13.92	13.07

Auditor industry expertise is measured at a national and a city level in this study. For completeness, the industry market share is calculated for all companies listed in the LSE with available audit fees data (N=1747), based on the 13 FAME major industry sectors classification (excluding the companies within the financial and insurance service industries). National auditor industry expertise is based on the auditor's annual market share of audit fees within each of the 13 FAME major industry sector. City level auditor industry expertise is calculated based on the auditor's annual market share of audit fees within each of the 13 FAME major industry sector for a particular city, after eliminating 296 observations located in cities having only one observation. Thus, there are 1,451 observations located in cities having two or more audits, which are used to calculate the city-specific industry leaders. Following Basioudis and Francis (2007), the data on the location of the accounting firm's lead engagement office is obtained from the office-specific letterhead of the audit report in order to analyse the city-specific industry leadership. However, the study acknowledges that this definition of industry specialist is arbitrary and may have errors in classifying auditors into the specialist and non-specialist groups (Habib, 2011). Therefore, in Chapter 8, sensitivity tests are conducted using several cut-off points to define industry specialist auditors.

Next, the following Table 6.4 reports the Big 4 audit firm market shares of audit fees for the industry leaders at the national and city levels, whereas Panel B reports the same for the audit partner. The top-ranked national industry leader has an annual average 58 percent of industry fees over the period

2008-2011 while the second ranked auditor has an annual average of 25 percent of industry fees. This reported market share is comparatively higher as compared to prior U.K. findings by Basioudis and Francis (2007) which documented a lower average market share for the Big 4 audit firm who is the top-ranked national industry leader and second-ranked national industry leader (at 45 percent and 22 percent respectively). The finding of 58 percent market share for the top-ranked national industry leader in this study is also higher as compared to the U.S. which is reported at 50 percent (Francis *et al*., 2005). Further analyses (untabulated) indicate that PWC is the top-ranked firm nationally in 9 out of 13 industries, while Deloitte is the second-ranked firm in 7 out of 13 industries (not tabulated).

For the audit firm city industry leadership reported in Panel A of Table 6.4, it can be seen that there are annual average of 64 unique city-industry combinations over the four years period, where the top-ranked auditor per industry has an average market share of 68 percent of the fees, and the second-ranked auditor has 27 percent. This is comparable to the earlier findings by Basioudis and Francis (2007) of 68 percent and 26 percent respectively. These city-level percentages are also comparable to the U.S. where the top-ranked auditor has an average market share of 69 percent and the second-ranked firm has 22 percent (Francis *et al*., 2005).

Panel B of Table 6.4 above also presents the audit partner industry leadership which is also measured at the national and city levels. The average market share for the top-ranked and the second-ranked audit partner at the industry level over the period 2008-2011 is at 40 percent and 19 percent respectively. Whereas the third, fourth, fifth and sixth audit partner have a lower market share of audit fees of 10 percent, 6 percent, 4 percent and 3 percent respectively. At the city level, the market share of the top-ranked partner is 60 percent on average over the four year period of the sample, followed by 27 percent for the second-ranked and 14 percent for the third-ranked audit partner.

Table 6.4: Descriptive statistics of auditor industry expertise

Panel A: Big 4 Audit firm market shares of audit fees (N=1,747)[a]

	2008		2009		2010		2011		Average	
	No.	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**
Top-ranked national industry leader	92	51.95	96	56.99	105	61.24	109	64.35	402	58
Second-ranked national industry leader	71	19.35	80	19.28	82	20.12	83	19.24	316	25
Top-ranked city industry leader	98	65	101	70	109	68	115	69	423	68
Second-ranked city industry leader	67	28	73	26	71	26	69	27	280	27
No. of industries		13		13		13		13		
No. of cities		16		19		18		19		
No. of city-industry combinations*		58		62		66		68	254	63.5

* based on two minimum observations per combination as per Basioudis and Francis (2007)

Panel B: Big 4 Audit partner market shares of audit fees (N=1,335)[b]

	2009		2010		2011		Average	
	No.	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**
Top-ranked national industry leader	13	40	13	39	13	39	39	40
Second-ranked national industry leader	13	47	13	44	13	48	39	19
Third-ranked national industry leader	12	10	13	9	13	10	38	10
Fourth-ranked national industry leader	14	5	14	5	14	7	42	6
Fifth-ranked 2006).national industry leader	12	4	12	4	12	4	36	4
Sixth-ranked national industry leader	14	3	12	3	12	3	38	3
Top-ranked city industry leader	57	60	66	61	67	63	190	60
Second-ranked city industry leader	45	25	47	26	53	28	145	27
Third-ranked city industry leader	26	13	29	14	29	19	84	14

[a] The sample size (N=1,747) is based on all observation in the sample between 2008-2011 with complete audit fees data, after excluding financial companies as described in Table 5.1 in the previous chapter.
[b] The sample size (N=1,335) is based on the sample presented in Panel A (N=1,747) after excluding the missing data on audit partner for year 2008 (N=412). This missing audit partner data is because the disclosure of the name of the senior statutory auditor (or engagement partner) signing off the auditor's report for and on behalf of the audit firm was only made mandatory in the U.K. for financial years beginning on or after 6 April 2008 (Section 503 of Companies Act

Additional analysis of audit market concentration (not tabulated) reveals that on average, 48 percent of companies from our sample are audited by London offices of the Big 4 firms, and paid an annual average of 84 percent of the sample audit fees. The three largest cities after London are Birmingham (8 percent), Manchester and Leeds (both at 6 percent). Similarly, 42 percent of the companies in the sample are headquartered in London, with only 33 percent of them being audited in London itself, while the remaining London-based companies are audited by audit offices based outside of London. 58 percent of the sample companies are located in 51 cities outside of London and are audited by non-London offices of the audit firms. This analysis of concentration shows that the audit market in the U.K. is dominated by London. This is not surprising given its role as the largest U.K. commercial centre where the large multinational companies are mainly headquartered. Given the smaller geographical size of U.K. relative to countries like U.S. and Australia, and the position of London as the primary commercial centre, it makes the role of city-offices less crucial in administering audit engagements, rather acting more as a shop front for the audit firms (Basioudis and Francis, 2007). Thus, it is logical to assume that industry expertise in the U.K. is more likely to be driven by the firm's total client base (national clientele) rather than city-specific expertise based on office-specific clienteles (Basioudis and Francis, 2007).

The evidence presented so far shows that the average market shares of the national industry auditors has increased in the period 2008-2011 in comparison to the ones in the period 2002-2003 (Basioudis and Francis, 2007). Given the financial crisis that started in 2007/2008 and the various changes in the corporate governance regulations, it may have seemed appropriate for the audit firms to shift their strategies and focus to their expertise at the national level rather than at the city level. The city-level expertise is not diminished at all from the Basioudis and Francis (2007) study but the national industry expertise has gained its prominence as compared to finding from earlier study.

6.3 Correlation matrix

The Table 6.5 below contains a correlation matrix showing the two-way Pearson correlations between all variables included in this study. The correlations are interesting as they highlight the associations between audit fees and the explanatory variables, and also identify the significant correlations among the independent variables (Tabachnick and Fidell, 2007). According to Hair *et al*. (2010), any correlation above 0.9 indicates the presence of multicollinearity problem, which may substantially affect the predictive ability of the regression model as well as the estimation of the regression coefficients. The single asterisks in the Table 6.5 below signify statistically significant correlations at 10 percent level ($p<0.10$). In general, the overall correlation matrix shows that audit fees and the independent variables (i.e. board diversity, internal audit, audit committee and related control variables) are moderately inter-correlated with one and another, with the exceptions of *LAF* and *LTA* (correlation coefficient of 88.5 percent), *JOINT_NAT#1-CITY#1* and *NAT#1* (correlation coefficient of 89.53 percent), *CITY#1_ONLY* and *PARCITY#1* (correlation coefficient of 85.4 percent), and *JOINT_NAT#1-CITY#1* and *CITY#1* (correlation coefficient 72.96 percent), which have the correlation coefficients above 70 percent. Consistent with previous studies, *LTA* has always been highly correlated to *LAF*, as client's size represents the main determinant of audit fees (Hay *et al*., 2006). Other than *LTA* and *LAF*, the other highly correlated variables above should not represent any multicollinearity problem as these variables are never analysed concurrently in a single model within this study. Diagnostics on the multicollinearity that is associated with each empirical model, using the Variance Inflation Factor (VIF) are provided earlier in Section 5.8.5.

The correlations in column A show how each of the explanatory variables are associated with the dependent variable, the natural logarithm of audit fees (*LAF*). Consistent with previous audit fees studies (e.g. Hay *et al*., 2006, Zaman *et al*., 2011, Basioudis and Francis, 2007), *LAF* is significantly and positively correlated to *LNAF*, *LTA*, *SQSUBS*, *FOREIGN*, *LONDON*, *BUSY* , *ROI* and *DE*. However, the negative and significant correlation between *LAF* and *OPINION*, *LOSS*, *QUICK*, *CATA*, *INITIAL* and *INSOWN* is somewhat counter-intuitive. In respect to the corporate governance variables, the coefficients in Table 6.5 indicate that board diversity (*BODFEM, BODFOREIGN*), internal audit (*IA*), and audit committee characteristics (*ACSIZE, ACINDP*, *ACFINEXP* and *ACMEET*) are all significantly positively correlated with *LAF*. For the industry specialist variables, *NAT#1*, *CITY#1*, *JOINT_NAT#1-CITY#1*, *PARNAT#1*, *PARCITY#1*, *PARJOINT_PARNAT#1-PARCITY#1*, *NAT#1-CITY#1_PARNAT#1PARCITY#1*, *NAT#0-CITY#1_PARNAT#1-PARCITY#1*, *NAT#0-CITY#0-PARNAT#1-PARCITY#1* *NAT#1-CITY#1_PARNAT#1-PARCITY#0*, *NAT#0-CITY#0_PARNAT#1-PARCITY#0* are significantly positively correlated with *LAF*, except for *CITY#1_ONLY, NAT#1_ONLY*, *PARCITY#1_ONLY*, *NAT#1-CITY#1_PARNAT#1-PARCITY#1*, *NAT#1-CITY#0_PARNAT#0-PARCITY#1*, *NAT#0-CITY#1_PARNAT#0-PARCITY#1*, *NAT#0-CITY#0_PARNAT#0-PARCITY#1*, *NAT#0-CITY#1_PARNAT#0-PARCITY#0*, *NAT#1-CITY#1_PARNAT#1-PARCITY#1* which are significantly negatively correlated with *LAF*. Because these correlations are pair-wise, the coefficient sign may differ in the multivariate analysis (Reichelt and Wang, 2010).

Table 6.5: Pairwise correlation matrix for the *LAF* model

Variables		**A**	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**I**	**J**	**K**	**L**	**M**
A	LAF	1.000												
B	LNAF	0.518*	1.000											
C	LTA	0.885*	0.444*	1.000										
D	SQSUBS	0.551*	0.241*	0.440*	1.000									
E	OPINION	-0.147*	-0.129*	-0.193*	-0.114*	1.000								
F	ROI	0.213*	0.130*	0.268*	0.140*	-0.184*	1.000							
G	DE	0.280*	0.121*	0.388*	0.062*	-0.136*	0.041	1.000						
H	LONDON	0.205*	0.098*	0.128*	0.024	0.099*	-0.021	0.016	1.000					
I	BUSY	0.183*	0.121*	0.097*	0.100*	0.080*	-0.004	-0.067*	0.092*	1.000				
J	LOSS	-0.256*	-0.107*	-0.305*	-0.173*	0.211*	-0.421*	-0.112*	0.054	0.010	1.000			
K	FOREIGN	0.194*	0.141*	0.050	0.098*	0.025	0.050	-0.008	0.158*	0.171*	-0.005	1.000		
L	QUICK	-0.247*	-0.142*	-0.228*	-0.163*	0.122*	-0.081*	-0.205*	-0.006	0.032	0.258*	0.032	1.000	
M	CATA	-0.271*	-0.064*	-0.380*	-0.037	-0.047	-0.073*	-0.395*	-0.145*	-0.021	0.096*	-0.055*	0.264*	1.00
N	INITIAL	-0.199*	-0.184*	-0.158*	-0.073*	0.065*	-0.082*	-0.069*	-0.020	0.062*	0.129*	-0.046	0.087*	- 0.020
O	BODFEM	0.308*	0.164*	0.361*	0.086*	-0.110*	0.099*	0.079*	0.082*	0.018	-0.091*	0.010	-0.125*	-0.103*
P	BODFOREIGN	0.302*	0.116*	0.210*	0.067*	0.206*	0.015	-0.030	0.359*	0.205*	0.057*	0.245*	0.040	-0.185*
Q	ACSIZE	0.455*	0.261*	0.495*	0.223*	-0.139*	0.074*	0.183*	0.098*	0.068*	-0.155*	0.080*	-0.133*	-0.160*
R	ACINDP	0.086*	0.052	0.089*	0.030	-0.093*	0.108*	-0.012	-0.033	0.022	-0.140*	-0.009	0.011	- 0.020
S	ACFINEXP	0.331*	0.135*	0.317*	0.201*	-0.015	0.025	0.126*	0.067*	0.064*	-0.023	-0.026	-0.058*	-0.201*
T	ACMEET	0.507*	0.256*	0.522*	0.254*	-0.056*	0.099*	0.149*	0.075*	0.125*	-0.132*	0.081*	-0.117*	-0.199*
U	ACE	0.372*	0.169*	0.387*	0.255*	-0.147*	0.115*	0.137*	0.005	0.058*	-0.201*	0.069*	-0.145*	-0.144*
V	INTAUD	0.570*	0.331*	0.628*	0.291*	-0.267*	0.251*	0.250*	-0.040	0.038	-0.299*	0.004	-0.285*	-0.214*
W	INSOWN	-0.227*	-0.059*	-0.249*	-0.136*	0.030	-0.104*	-0.108*	-0.097*	0.016	0.036	-0.053	-0.016	0.097*
X	NAT#1	0.175*	0.059*	0.158*	0.080*	0.012	0.092*	0.017	-0.047	0.025	-0.061*	-0.018	-0.073*	-0.078*
Y	CITY#1	0.115*	0.028	0.106*	0.058*	0.020	0.018	0.075*	-0.106*	0.059*	-0.027	-0.038	-0.085*	- 0.050
Z	JOINT_NAT#1-CITY#1	0.243*	0.080*	0.229*	0.086*	0.008	0.092*	0.041	-0.006	0.041	-0.068*	0.016	-0.071*	-0.107*
Variables		**N**	**O**	**P**	**Q**	**R**	**S**	**T**	**U**	**V**	**W**	**X**	**Y**	**Z**
N	INITIAL	1.000												
O	BODFEM	-0.094*	1.000											
P	BODFOREIGN	-0.047	0.046	1.000										
Q	ACSIZE	-0.065*	0.321*	0.113*	1.000									
R	ACINDP	-0.080*	0.054	-0.014	-0.087*	1.000								
S	ACFINEXP	0.031	0.024	0.129*	0.043	0.135*	1.000							
T	ACMEET	-0.053	0.154*	0.204*	0.342*	0.113*	0.255*	1.000						
U	ACE	-0.083*	0.168*	0.023	0.321*	0.427*	0.154*	0.513*	1.000					

* is significant at $p<0.10$. All p-values are two-tailed. Refer Table 5.8 for definition of variables.

Table 6.5: Pairwise correlation matric for the *LAF* model (continued)

Variables		**N**	**O**	**P**	**Q**	**R**	**S**	**T**	**U**	**V**	**W**	**X**	**Y**	**Z**
V	INTAUD	-0.161*	0.290*	-0.045	0.320*	0.159*	0.262*	0.383*	0.397*	1.000				
W	INSOWN	0.018	-0.105*	-0.176*	-0.159*	0.026	-0.018	-0.133*	-0.016	-0.082*	1.000			
X	NAT#1	-0.088*	0.044	0.046	0.066*	0.024	0.044	-0.022	0.079*	0.055*	-0.039	1.000		
Y	CITY#1	-0.113*	0.028	-0.020	0.038	0.030	0.014	-0.012	0.067*	0.031	-0.019	0.608*	1.000	
Z	JOINT_NAT#1-CITY#1	-0.111*	0.096*	0.075*	0.107*	0.067*	0.086*	0.029	0.102*	0.116*	-0.057*	0.895*	0.729*	1.000
Variables		**A**	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**I**	**J**	**K**	**L**	**M**
AA	CITY#1_ONLY	-0.156*	-0.065*	-0.149*	-0.031	0.018	-0.095*	0.052	-0.140*	0.030	0.051	-0.074*	-0.027	0.072*
BB	NAT#1_ONLY	-0.133*	-0.040	-0.139*	-0.008	0.010	0.008	-0.051	-0.091*	-0.031	0.010	-0.074*	-0.010	0.057*
CC	PARNAT#1	0.504*	0.251*	0.412*	0.225*	0.028	0.033	0.123*	0.145*	0.127*	-0.050	0.134*	-0.061	-0.153*
DD	PARCITY#1	0.119*	0.053	0.087*	0.092*	0.009	0.031	0.067*	-0.180*	0.068*	-0.039	-0.019	-0.072*	0.01
EE	PARJOINT_PARTNAT#1-PARCITY#1	0.504*	0.251*	0.412*	0.225*	0.028	0.033	0.123*	0.145*	0.127*	-0.050	0.134*	-0.061	-0.153*
FF	PARCITY#1_ONLY	-0.158*	-0.085*	-0.140*	-0.028	-0.007	0.015	0.002	-0.279*	0.001	-0.013	-0.097*	-0.044	0.102*
GG	PARNAT#1_ONLY	.	.	.	.	.	.	.	.	.	.	.	.	.
HH	NAT#1-CITY#1_PARNAT#1-PARCITY#1	0.525*	0.261*	0.446*	0.298*	0.000	0.050	0.115*	0.099*	0.108*	-0.051	0.133*	-0.083*	-0.148*
II	NAT#1-CITY#1_PARNAT#0-PARCITY#1	-0.209*	-0.063*	-0.221*	-0.089*	-0.013	0.026	-0.127*	-0.199*	-0.039	0.029	-0.030	-0.066*	0.108*
JJ	NAT#1-CITY#0_PARNAT#1-PARCITY#1	.	.	.	.	.	.	.	.	.	.	.	.	.
KK	NAT#1-CITY#0_PARNAT#1-PARCITY#1	-0.094*	-0.034	-0.031	-0.068*	-0.024	-0.007	0.049	-0.054	-0.017	-0.053	-0.057	0.059	- 0.01
LL	NAT#0-CITY#1_PARNAT#1-PARCITY#1	0.315*	0.109*	0.274*	0.204*	0.036	0.044	0.135*	0.033	0.087*	-0.077*	0.135*	-0.030	-0.136*
MM	NAT#0-CITY#1_PARNAT#0-PARCITY#1	-0.311*	-0.143*	-0.301*	-0.134*	-0.038	-0.057	0.048	-0.163*	-0.095*	0.017	-0.093*	-0.035	0.066*
NN	NAT#0-CITY#0_PARNAT#1-PARCITY#1	0.143*	0.093*	0.116*	0.037	-0.035	0.016	0.012	0.040	0.067*	-0.029	0.053	-0.023	0.00
OO	NAT#0-CITY#0_PARNAT#0-PARCITY#1	-0.130*	-0.049	-0.073*	-0.065*	0.048	-0.075*	0.057	-0.055	-0.080*	0.101*	0.021	0.139*	0.112*
PP	NAT#1-CITY#1_PARNAT#1-PARCITY#0	0.090*	0.029	0.088*	0.076*	-0.031	0.052	0.067*	0.027	0.028	-0.042	0.020	0.002	- 0.04
QQ	NAT#1-CITY#1_PARNAT#0-PARCITY#0	-0.055	-0.138*	-0.014	-0.110*	0.055	0.032	-0.023	0.058	-0.048	-0.019	-0.087*	0.059	-0.065*
RR	NAT#1-CITY#0_PARNAT#1-PARCITY#0	0.036	0.022	0.002	0.028	-0.009	0.001	0.026	-0.032	0.028	-0.020	-0.034	-0.010	- 0.01
SS	NAT#1-CITY#0_PARNAT#0-PARCITY#0	-0.009	0.009	-0.023	0.056	-0.013	0.013	-0.047	0.066*	-0.017	-0.028	-0.030	-0.005	0.063*
TT	NAT#0-CITY#1_PARNAT#1-PARCITY#0	0.088*	0.052	0.102*	0.092*	-0.010	0.020	0.089*	-0.001	-0.070*	0.014	-0.008	-0.049	-0.084*
UU	NAT#0-CITY#1_PARNAT#0-PARCITY#0	-0.134*	-0.065*	-0.101*	-0.107*	-0.032	-0.096*	-0.122*	0.060	-0.017	0.082*	0.012	0.063*	0.05
VV	NAT#0-CITY#0_PARNAT#1-PARCITY#0	0.120*	0.069*	0.097*	0.020	-0.046	0.046	-0.045	-0.023	0.017	-0.065*	0.054	-0.021	0.04

* is significant at *p*<0.10. All p-values are two-tailed. PARNAT#1_ONLY (GG) and NAT#1-CIT#0_PARNAT#1-PARCITY#1 (JJ) are empty due to missing observations Refer Table 5.8 for definition of variables.

Table 6.5: Pairwise correlation matric for the *LAF* model (continued)

Variables		N	O	P	Q	R	S	T	U	V	W	X	Y	Z
AA	CITY#1_ONLY	-0.014	-0.087*	-0.126*	-0.087*	-0.046	-0.093*	-0.055	-0.039	-0.109*	0.048	-0.313*	0.451*	-0.280*
BB	NAT#1_ONLY	0.042	-0.109*	-0.059*	-0.083*	-0.091*	-0.088*	-0.109*	-0.044	-0.126*	0.037	0.303*	-0.210*	
CC	PARNAT#1	-0.095*	0.159*	0.241*	0.280*	0.006	0.260*	0.174*	0.084*	0.130*	-0.191*	0.315*	0.267*	0.356*
DD	PARCITY#1	-0.059	-0.017	-0.011	0.064*	0.027	-0.003	0.028	0.015	0.060	-0.064*	0.207*	0.597*	0.285*
EE	PARJOINT_PARTNAT#1-PARCITY#1	-0.095*	0.159*	0.241*	0.280*	0.006	0.260*	0.174*	0.084*	0.130*	-0.191*	0.315*	0.267*	0.356*
FF	PARCITY#1_ONLY	-0.009	-0.108*	-0.149*	-0.089*	0.026	-0.151*	-0.069*	-0.032	-0.009	0.039	0.046	0.496*	0.107*
GG	PARNAT#1_ONLY	.	.	.	.	.	.	.	.	.	.	.	.	.
HH	NAT#1-CITY#1_PARNAT#1-PARCITY#1	-0.126*	0.179*	0.161*	0.269*	0.020	0.248*	0.129*	0.112*	0.220*	-0.167*	0.479*	0.371*	0.520*
II	NAT#1-CITY#1_PARNAT#0-PARCITY#1	-0.012	-0.098*	-0.079*	-0.122*	-0.044	-0.137*	-0.130*	-0.053	-0.151*	0.079*	0.523*	0.243*	0.393*
JJ	NAT#1-CITY#0_PARNAT#1-PARCITY#1	.	.	.	.	.	.	.	.	.	.	.	.	.
KK	NAT#1-CITY#0_PARNAT#1-PARCITY#1	0.047	-0.036	-0.038	-0.015	-0.059	-0.019	-0.022	0.006	-0.023	0.072*	0.135*	-0.094*	-0.067*
LL	NAT#0-CITY#1_PARNAT#1-PARCITY#1	-0.043	0.088*	0.151*	0.091*	0.059	0.122*	0.204*	0.128*	0.147*	-0.137*	-0.211*	-0.079*	-0.187*
MM	NAT#0-CITY#1_PARNAT#0-PARCITY#1	0.026	-0.112*	-0.199*	-0.142*	-0.020	-0.101*	-0.098*	-0.060	-0.137*	0.135*	-0.385*	0.084*	-0.342*
NN	NAT#0-CITY#0_PARNAT#1-PARCITY#1	0.001	0.030	-0.000	0.052	0.041	0.037	0.034	0.015	0.104*	0.024	-0.112*	-0.138*	-0.100*
OO	NAT#0-CITY#0_PARNAT#0-PARCITY#1	0.077*	-0.081*	-0.050	-0.007	-0.030	-0.030	-0.057	-0.136*	-0.050	-0.006	-0.120*	-0.147*	-0.106*
PP	NAT#1-CITY#1_PARNAT#1-PARCITY#0	-0.019	-0.045	0.050	0.068*	0.037	0.009	0.026	0.090*	0.093*	-0.019	0.178*	0.145*	0.201*
QQ	NAT#1-CITY#1_PARNAT#0-PARCITY#0	-0.017	0.060	-0.010	-0.035	0.012	-0.016	-0.034	-0.002	-0.029	0.005	0.391*	0.285*	0.405*
RR	NAT#1-CITY#0_PARNAT#1-PARCITY#0	-0.015	-0.028	-0.026	-0.053	0.011	-0.067*	-0.012	-0.057	0.027	0.027	0.051	-0.035	-0.026
SS	NAT#1-CITY#0_PARNAT#0-PARCITY#0	0.059	-0.040	-0.037	-0.016	0.015	0.024	-0.017	0.037	-0.020	-0.031	0.072*	-0.050	-0.036
TT	NAT#0-CITY#1_PARNAT#1-PARCITY#0	-0.030	0.071*	0.006	0.051	-0.029	0.026	0.028	0.030	0.085*	-0.065*	-0.146*	-0.164*	-0.130*
UU	NAT#0-CITY#1_PARNAT#0-PARCITY#0	0.047	-0.053	-0.079*	-0.051	0.031	-0.001	-0.061	-0.044	-0.023	0.131*	-0.248*	-0.206*	-0.220*
VV	NAT#0-CITY#0_PARNAT#1-PARCITY#0	-0.032	0.107*	0.059	0.072*	0.005	0.013	0.082*	0.051	0.122*	0.015	-0.149*	-0.184*	-0.132*
Variables		**AA**	**BB**	**CC**	**DD**	**EE**	**FF**	**GG**	**HH**	**II**	**JJ**	**KK**	**LL**	**MM**
AA	CITY#1_ONLY	1.000												
BB	NAT#1_ONLY	-0.094*	1.000											
CC	PARNAT#1	-0.087*	-0.058	1.000										
DD	PARCITY#1	0.460*	-0.143*	0.406*	1.000									
EE	PARJOINT_PARTNAT#1-PARCITY#1	-0.087*	-0.058	1.000*	0.406*	1.000								
FF	PARCITY#1_ONLY	0.549*	-0.122*	-0.127*	0.854*	-0.127*	1.000							
GG	PARNAT#1_ONLY	.	.	.	.	.	.	.						
HH	NAT#1-CITY#1_PARNAT#1-PARCITY#1	-0.153*	-0.044	0.665*	0.291*	0.665*	-0.062	.	1.000					
II	NAT#1-CITY#1_PARNAT#0-PARCITY#1	-0.167*	0.312*	-0.097*	0.219*	-0.097*	0.293*	.	-0.141*	1.000				

*is significant at p<0.10. All p-values are two-tailed. PARNAT#1_ONLY (GG) and NAT#1-CIT#0_PARNAT#1-PARCITY#1 (JJ) are empty due to missing observations. Refer Table 5.8 for definition of variables.

Table 6.5: Pairwise correlation matric for the *LAF* model (continued)

Variables		**AA**	**BB**	**CC**	**DD**	**EE**	**FF**	**GG**	**HH**	**II**	**JJ**	**KK**	**LL**	**MM**
JJ	NAT#1-CITY#0_PARNAT#1-PARCITY#1	.	.	.	.	.	.	.	.	.	.			
KK	NAT#1-CITY#0_PARNAT#1-PARCITY#1	-0.043	0.431*	-0.025	-0.062	-0.025	-0.053	.	-0.037	-0.040	.	1.000		
LL	NAT#0-CITY#1_PARNAT#1-PARCITY#1	0.130*	-0.066*	-0.045	0.020	-0.045	0.047	.	-0.101*	-0.110*	.	-0.029	1.000	
MM	NAT#0-CITY#1_PARNAT#0-PARCITY#1	0.555*	-0.121*	-0.126*	0.251*	-0.126*	0.344*	.	-0.184*	-0.201*	.	-0.052	-0.144*	1.000
NN	NAT#0-CITY#0_PARNAT#1-PARCITY#1	-0.063*	-0.036	-0.037	-0.046	-0.037	-0.029	.	-0.054	-0.059	.	-0.015	-0.042	-0.077*
OO	NAT#0-CITY#0_PARNAT#0-PARCITY#1	-0.068*	-0.038	-0.040	-0.075*	-0.040	-0.060	.	-0.058	-0.063	.	-0.016	-0.045	-0.082*
PP	NAT#1-CITY#1_PARNAT#1-PARCITY#0	-0.057	-0.032	-0.033	-0.081*	-0.033	-0.069*	.	-0.048	-0.053	.	-0.014	-0.038	-0.068*
QQ	NAT#1-CITY#1_PARNAT#0-PARCITY#0	-0.124*	0.003	-0.072*	-0.178*	-0.072*	-0.152*	.	-0.105*	-0.115*	.	-0.030	-0.082*	-0.150*
RR	NAT#1-CITY#0_PARNAT#1-PARCITY#0	-0.016	0.1623*	-0.010	-0.023	-0.010	-0.020	.	-0.014	-0.015	.	-0.004	-0.011	-0.020
SS	NAT#1-CITY#0_PARNAT#0-PARCITY#0	-0.023	0.2297*	-0.013	-0.033	-0.013	-0.028	.	-0.020	-0.021	.	-0.006	-0.015	-0.028
TT	NAT#0-CITY#1_PARNAT#1-PARCITY#0	-0.061	-0.046	-0.048	-0.118*	-0.048	-0.101*	.	-0.070*	-0.076*	.	-0.020	-0.055	-0.100*
UU	NAT#0-CITY#1_PARNAT#0-PARCITY#0	-0.003	-0.078*	-0.081*	-0.200*	-0.081*	-0.171*	.	-0.119*	-0.129*	.	-0.034	-0.093*	-0.169*
VV	NAT#0-CITY#0_PARNAT#1-PARCITY#0	-0.084*	-0.047	-0.049	-0.121*	-0.049	-0.103*	.	-0.071*	-0.078*	.	-0.020	-0.056	-0.102*
Variables		**NN**	**OO**	**PP**	**QQ**	**RR**	**SS**	**TT**	**UU**	**VV**				
NN	NAT#0-CITY#0_PARNAT#1-PARCITY#1	1.000												
OO	NAT#0-CITY#0_PARNAT#0-PARCITY#1	-0.024	1.000											
PP	NAT#1-CITY#1_PARNAT#1-PARCITY#0	-0.020	-0.022	1.000										
QQ	NAT#1-CITY#1_PARNAT#0-PARCITY#0	-0.044	-0.047	-0.039	1.000									
RR	NAT#1-CITY#0_PARNAT#1-PARCITY#0	-0.006	-0.006	-0.005	-0.011	1.000								
SS	NAT#1-CITY#0_PARNAT#0-PARCITY#0	-0.008	-0.009	-0.007	-0.016	-0.002	1.000							
TT	NAT#0-CITY#1_PARNAT#1-PARCITY#0	-0.029	-0.031	-0.026	-0.057	-0.008	-0.011	1.000						
UU	NAT#0-CITY#1_PARNAT#0-PARCITY#0	-0.050	-0.053	-0.044	-0.097*	-0.013	-0.018	-0.064*	1.000					
VV	NAT#0-CITY#0_PARNAT#1-PARCITY#0	-0.030	-0.032	-0.027	-0.059	-0.008	-0.011	-0.039	-0.065*	1.000				

*is significant at p<0.10. All p-values are two-tailed. PARNAT#1_ONLY (GG) and NAT#1-CIT#0_PARNAT#1-PARCITY#1 (JJ) are empty due to missing observations. Refer Table 5.8 for definition of variables.

CHAPTER 7

MULTIVARIATE ANALYSIS: THE EFFECT OF INDUSTRY SPECIALIST AUDITORS AND CORPORATE GOVERNANCE ON AUDIT QUALITY

7.1 Introduction

Having analysed and explained the descriptive statistics of the data used to study the effect of industry specialist auditors and corporate governance on audit quality (proxy by the variation in the level of audit fees) in Chapter 6, the multivariate analysis which follows in Chapter 7 examines the relationship between industry specialist auditors and corporate governance on audit fees. This analysis extends the analysis in Basioudis and Francis (2007) and provides a comparison to the results obtained in Basioudis and Francis (2007) in the period 2002-2003. This analysis is also the starting point, as the main focus of the PhD is the effect of the industry specialist auditors and corporate governance on earnings quality in the U.K. As a first step, the effect of the industry specialist auditors and corporate governance on audit fees is examined in this chapter. Then, to extend this line of research, the second empirical study investigates the effect of the industry specialist auditors in conjunction with corporate governance on earnings quality in Chapter 9 to Chapter 11.

7.2 Multivariate analysis

The audit pricing analyses are performed under three different levels of analysis for auditor industry specialisation: 1) firm national-city framework, 2) partner national-city framework, and 3) joint firm-partner national-city framework. As in prior studies using the national and city framework (Francis et al., 2005; Basioudis and Francis, 2007), three models are reported for comparative purposes under the firm national-city framework and partner national-city framework analyses. In this study, the same frameworks are adopted and the three models in each analysis are described as follows: Model 1 tests the effect of firm (partner) national industry leadership and corporate governance on audit fees. Model 2 tests the effect of firm (partner) city-specific industry leadership and corporate governance on audit fees. Model 1 and Model 2 are provided for completeness, while Model 3 represents the model of interest as it controls for the joint effect of firm (partner) national and city industry leadership and corporate governance on audit fees.

Following Francis et al. (2005), the determination of the national industry leader in Model 1 and the city-specific industry leader in Model 2, respectively, is based on an iterative process. The iterative process starts with only one indicator variable for the top-ranked leader (either national or city-specific) in the first estimation, and then adds a second indicator variable for the second-ranked leader in the second estimation, and so on until the introduction of an additional ranking variable is not statistically significant or, in other words, does not have an effect on audit fees. This iterative process determines the top-ranked Big 4 industry leaders (firm or partner) which have a significant coefficient relative to the remaining Big 4 non-industry leaders. For example, *NAT#1* represents an indicator variable coded 1 if the audit firm is the top-ranked industry leader nationally (coded zero if otherwise), given that, based on the iterative process in Model 1, only the top-ranked audit firms nationally are able to extract fee premiums. However, if the iterative process indicates that the second-ranked audit firm industry leader nationally is also able to extract a fee premium, then the indicator variable would be *NAT#2*, which is coded 1 if the audit firm ranked as being in the top-two industry leaders nationally (coded zero if otherwise). Consequently, the determination of the joint national-city industry leader in Model 3 would be derived from the combination of the top-ranked leaders identified in Model 1 and Model 2, respectively. This iterative process applies under both the firm national-city framework (Section 7.2.1) and the partner national-city framework (Section 7.2.2).

Under the joint firm-partner national-city framework (Section 7.2.3), the industry specialist auditor variables (e.g. *NAT#-CITY#_PARNAT#-PARCITY#*) are derived from the combination of firm and partner industry leadership. The ranking for the firm and partner either nationally or at the city-specific level is determined from the firm national-city framework (Section 7.2.1) and partner national-city framework (Section 7.2.2), respectively. For instance, *NAT#1-CITY#1_PARNAT#6-PARCITY#3* (in Table 7.5) is a variable which represents the combined industry leadership of both the audit firm and the partner, where the audit firm is the first ranked by market share nationally (*NAT#1*), the office is in the top-ranked by city-industry market share (*CITY#1*), the partner is in the top six ranked by market share nationally (*PARNAT#6*), and the partner is in the top three ranked by city-industry market share (*PARCITY#3*).

The significance levels for model coefficients are reported as one-tailed *p*-values, except for the industry specialist auditor variables and corporate governance variables which are reported as two-tailed *p*-values. Industry fixed-effects and year fixed-effects are not reported for brevity, and *t*-statistics and *p*-values are calculated using the White (1980) robust standard errors to correct for heteroscedasticity[12].

7.2.1 Firm national-city framework

Results in Table 7.1 below are derived based on 892 observations. The sample selection process for this empirical analysis is explained in Table 5.1 earlier. In short, this final sample is derived after

[12] According to Petersen (2009) and Gow *et al*. (2010), the use of OLS or White (1980) standard error fails to correct for both cross-sectional and time-series dependence in panel data, thus producing mis-specified test-statistics and invalid inferences about the relationship of the variables examined. Instead, the econometric literature shows that two-way cluster robust standard errors have both time-series and cross-sectional correlation (Thompson, 2006; Petersen, 2009). Thus, a sensitivity analysis is performed in the next chapter in Section 8.2., where all the regressions are re-estimated using 1) robust standard error clustered by firm, and 2) two-way cluster robust standard error clustered by firm and year. Interestingly, qualitatively similar results are reported as per the main findings in Section 7.2.1, indicating that the results are not sensitive to specific types of regression estimators used in the study.

excluding sample with less than two city-specific observations per industry (*N*=283), 88 observations with missing corporate governance variables and 486 non-Big 4 observations from the full sample with complete audit fees data (N=1,747). This screening is performed so as to ensure that the audit market for all the cities in specific industries analysed is competitive where more than one audit client exists; moreover, using only the Big 4 sample allows us to test directly whether Big 4 industry leaders have a fee premium relative to other Big 4 auditors who are non-leaders. There is an average of four observations per city-industry combination, which is similar to what has been documented in a prior U.K. study by Basioudis and Francis (2007), and also is comparable to the six observations per city-industry combination in the U.S. reported in Francis *et al*. (2005).

Following Ferguson *et al*. (2003), under the national-city framework analysis, the fee premium for industry leadership is estimated using three model specifications: Model 1 tests the effect of national level industry leadership per se on differential Big 4 audit pricing relative to other Big 4 who are non-leaders; Model 2 tests the effect of city-specific industry leadership per se relative to companies audited by Big 4 who are non-leaders (note that while Models 1 and 2 are provided for completeness, they are not the primary models of interest because they do not control for the joint effect of national and city-specific industry leadership on audit pricing); Model 3 is the primary model of interest because it controls explicitly for the joint effect of national and city-specific industry leadership through the use of three auditor indicator variables. In order to perform Model 3, the final sample of Big 4 audited companies (N=892) is partitioned into the following three groups: 1) companies audited by auditors that are jointly the national industry leader and the city-specific industry leader; 2) companies audited by the city-specific industry leader without also being the national industry leader; and 3) companies audited by the national industry leader without also being the city-specific industry leader. The purpose of these three partitions is to test for the separate effects of national and city-specific industry leadership on audit pricing, as well as to isolate the joint effect of national and city-specific industry leadership on pricing. The default comparison group is companies whose Big 4 auditors that are neither national nor city-specific industry leaders.

Panel A of Table 7.1 represents the audit fee regression excluding the corporate governance variables, whereas Panel B of Table 7.1 represents the final results of interest, where corporate governance is being tested simultaneously in the model alongside the industry specialist auditors. The purpose of these tests of exclusion and then inclusion of corporate governance variables in the models is to examine whether the omission of those monitoring mechanisms has any effect on the models' explanatory power (*R*-square), and whether there is a change in the effect of the industry specialist auditors (based on any changes observed on the fee premium or fee discount (if any) reported by the industry specialist auditors). Previous studies on auditor industry specialisation (e.g. Basioudis and Francis, 2007; Francis *et al*., 2005; Hay and Jeter, 2011) have failed to control for the effect of corporate governance in their models despite these numerous variables having been previously shown to explain the variation in audit fees (e.g. Goodwin-Stewart and Kent, 2006; Krishnan and

Visvanathan, 2009; Zaman *et al*., 2011). Furthermore, as earlier demonstrated in the correlation analysis in Table 6.3, the industry specialist auditor variables to some extent are correlated with the various corporate governance variables, which means that exclusion of corporate governance in the regression models could have significant implications for the study's internal validity. Previous studies have also shown that companies with effective corporate governance are likely to recruit industry specialist auditors (e.g. Abbott and Parker, 2000; Chen *et al*., 2005), and industry specialist auditors are likely to charge audit fee premiums in the presence of a strong corporate governance function. Thus, it is possible that the measure of industry specialist auditors in previous studies is capturing the impact of corporate governance characteristics of the firm.

Table 7.1 below reports the results of the three model estimations for the audit firm national-city framework, as described above[13]. Results in Panel A present the regression results before the inclusion of corporate governance variables, whereas in Panel B, the regression results are tabulated with the inclusion of the corporate governance variables to determine the effect of corporate governance on the industry specialist premium. As mentioned before, as compared to Model 1 and Model 2, Model 3 is the model of interest as it controls for the joint effect of national and city-specific industry leadership of the Big 4 audit firms on audit pricing. Once the corporate governance variables are controlled for in the model, the models explanatory power (^{R2}) increases from 87.3 percent (R^2 for Model 3 in Panel A) to 88.1 percent (R^2 for Model 3 in Panel B), and the coefficient for the Big 4 joint national and city-specific industry leader (*JOINT*) reduces slightly from 0.081 to 0.068, which indicates that the corporate governance characteristics of a firm do explain a considerable portion (1.3 percent or 0.013 difference between the coefficient 0.081 and 0.068) of the auditor industry specialist effect on audit fees. The significance of the results for the control variables and industry specialist auditor variables in Panel A and Panel B is qualitatively the same, except that *OPINION* has lost its significance in Panel B, as the industry specialist auditors may rely more on the corporate governance function as an internal monitoring mechanism. The final results are interpreted based on the outcome of Panel B. All control variables *LNAF*, *LTA*, *SQRTSUBS*, *ROI*, *FOREIGN*, *QUICK*, *CATA*, *LONDON*, *BUSY* and *INITIAL* are significant at the conventional levels and in the expected direction, except for *DE* which is significant at p<0.01 but in the opposite direction, while *LOSS* and *INSOWN* are insignificant. The significant negative relationship reported between *DE* and audit fees in this study is consistent with a prior U.K. study by Zaman *et al*. (2011) which included corporate governance and Big 4 variables in their audit fee models. The variable *LOSS* is also insignificant. The insignificant findings for *INSOWN* is consistent with findings from prior U.K. study by O'Sullivan (2000) but inconsistent with a later U.K. study by Zaman *et al*. (2011). Nevertheless, overall, results of the control variables support the notion that client characteristics such as size (*LTA*), complexity (*SQRTSUBS*, *FOREIGN*), profitability (*ROI*), inherent risk (*CATA*, *QUICK*) and the auditor production costs (*BUSY*, *LNAF*, *LONDON*,

[13] The significance levels for model coefficients are reported as one-tailed p-values, except for the industry specialist auditor variables and corporate governance variables which are reported as two-tailed p-values. Industry fixed-effects and year fixed-effects are not reported for brevity, and t-statistics and p-values are calculated using the White (1980) robust standard errors to correct for heteroscedasticity.

INITIAL) affect audit risk and audit effort, contributing to the variation in the level of audit fees (Hay *et al.*, 2006).

Next, results for the industry specialist auditor experimental variable under the firm national-city framework are discussed. Model 1 tests the effect of national industry leadership on audit pricing, without controlling for the effect of joint national and city-specific industry leadership. The estimation of Model 1 is an iterative process, as explained earlier at the beginning of Section 7.2, starting with only one indicator variable for the nationally top-ranked firm in the first estimation, and then adding a second indicator variable for the second-ranked firm in the second estimation, and so on until the introduction of an additional ranking variable is not statistically significant. This iterative process results in only the nationally top-ranked Big 4 firm having a significant fee premium relative to the remaining Big 4 firms. Only the auditor indicator variable for the top-ranked firm is found to be significant, as when the second specification (not tabulated) is estimated with an additional auditor indicator variable for the second-ranked auditor in the industry, the result is insignificant. Thus, the results for Model 1 reported in Panel B Table 7.1 below use a single auditor indicator variable that takes on the value of 1 if an audit firm is the nationally top-ranked firm in an industry (*NAT#1*) and tests the effect of national level industry leadership per se on differential Big 4 audit pricing for N=322 observations in which the Big 4 auditor is the national industry leader, and the default comparison group is all of the remaining 570 observations not having Big 4 national industry leaders. The *NAT#1* coefficient value is 0.059 (p<0.01), which equates to an average audit fee premium of 6.07 percent for the nationally top-ranked firm in the industry.[14] This finding of fee premium for audit firm industry leadership is consistent with prior studies in the U.S. (Francis *et al*., 2005; Mayhew and Wilkins, 2003; Cahan *et al*., 2011, 2015), Australia (Ferguson *et al*., 2003; Craswell *et al*., 1995), Hong Kong (Defond *et al*. 2000), and New Zealand (Hay and Jeter, 2011), and also is consistent with a cross-country study by Carson (2009) that provides evidence of a national industry specialist premium.

However, the finding of fee premium for national industry leaders in this study is inconsistent with a few studies in the U.S. (Palmrose, 1986; Pearson and Trompeter, 1994; Francis *et al*., 2005: Francis and Yu, 2009), Australia (Ferguson and Stokes, 2002), and New Zealand (Hay and Jeter, 2011). More importantly, it is inconsistent with the only prior U.K. evidence provided in Basioudis and Francis (2007) study which reported insignificant evidence of fee premium using the national market share measures of auditor industry expertise.

Model 2 tests the effect of city-specific industry leadership on audit pricing, without controlling for the joint national and city-specific industry leadership effect. The estimation of Model 2 follows the same iterative process, as described earlier, starting with the top-ranked firm at the city level in the first estimation, and adding a second and third indicator variable for the second-ranked firm and third-

[14] Following Berndt (1991, p. 164), the percentage magnitude of the positive intercept shift on the dependent variable (natural log of audit fees) is defined as e^{z-1}, where z is the auditor coefficient value in the regression model.

ranked firm in the following estimations. The results indicate that only the top-ranked firm has a significant fee premium relative to other Big 4 firms, but not for the second or third-ranked leader. This finding is consistent with the only prior study from the U.K. (Basioudis and Francis, 2007) as well as other studies from Australia (e.g. Ferguson *et al.*, 2003) and the U.S. (e.g. Francis *et al.*, 2005) which fail to report any evidence of fee premiums for second-ranked city-specific industry leaders.

Thus, the results for Model 2 reported in Table 7.1 below use a single auditor indicator variable coded 1 if the audit firm is the top-ranked city-specific industry leader (*CITY#1*), and tests the effect of city-specific leadership per se for N=410 observations in which the Big 4 auditors are the top-ranked city-specific industry leaders, and the default comparison group is the remaining 482 observations not audited by city-specific industry leaders. The coefficient value for *CITY#1* is 0.043 and is significant ($p<0.01$), which equates to an average audit fee premium of 4.39 percent for the top-ranked city-specific industry leaders. Note that the city-specific industry leadership premium in Model 2 (4.39 percent) is less than the national leadership premium in Model 1 (6.07 percent). This finding on the city-industry level specialist premium is consistent with previous studies in Australia (Ferguson *et al*., 2003), in the U.S. (Francis *et al*., 2005; Fung *et al*., 2012; Choi *et al*., 2010), in New Zealand (Hay and Jeter, 2011) and the only prior U.K. study by Basioudis and Francis (2007). Interestingly, in their study, Basioudis and Francis (2007) reported a fee premium of 16 percent for the Big 4 city-specific industry leader, which is about 5.08 percent higher when compared to 4.39 percent reported in this study. A possible explanation for this is that there has been a shift in the Big 4 audit firm focus in terms of its industry specialisation strategy, from city-specific to national level industry leadership. It is suggested that this effort is aimed at improving the transferability of industry expertise and knowledge sharing between the audit offices across the country, in order to achieve more standardised audit quality within the audit firm. This is plausible given the increased scrutiny over the audit quality of the Big 4 auditors during the period of the financial crisis.

While Models 1 and 2 provide evidence that both national industry leadership per se and city-specific industry leadership per se have positive effects on the pricing of Big 4 industry expertise in the U.K, they are not the primary models of interest. While Models 1 and Model 2 are provided for completeness, Model 3 is the primary model of interest because it controls explicitly for the joint effect of national and city-specific industry leadership through the use of three auditor indicator variables. The first auditor indicator variable is coded 1 for 278 observations (31 percent of the sample) in which the audit firm is both the top-ranked national leader and the top-ranked city-industry leader; the second auditor indicator variable is coded 1 for 132 observations (15 percent of the sample) in which the audit firm is the top-ranked city-industry leader but not the top national leader; and the third auditor indicator variable is coded 1 for 44 observations (5 percent of the sample) in which the auditor is the top national industry leader but not the top-ranked city-industry leader.

In other words, and following on from the presentation of the specialist auditor data in the previous paragraphs, companies with auditors that are national industry leaders (N=322) can be decomposed into those audited by national leaders alone (N=44), plus those whose auditors are joint national and city-specific industry leaders (N=278). Similarly, companies with auditors that are city-specific industry leaders (N=410) can be decomposed into those audited by city-specific industry leaders alone (N=132), plus those auditors that are jointly national and city-specific industry leaders (N=278). The purpose of these three partitions is to test for the separate effects of national and city-specific industry leadership on audit pricing, as well as to isolate the joint effect of national and city-specific industry leadership on pricing. The default comparison group is the 438 observations (49 percent of the sample) in which the auditor is neither a national nor city industry leader.

Results of Model 3 in Table 7.1 show that neither national industry leadership alone nor city-specific industry leadership alone results in a fee premium, as coefficients for *CITY#1_ONLY* and *NAT#1_ONLY* are not significant at conventional levels (p >0.10). Instead, the fee premium for industry leadership is only earned by the city-specific industry leaders if and when they are also national industry leaders. The coefficient *JOINT_NAT#1-CITY#1* for joint national and city-specific industry leadership is 0.081 (p < 0.01), which represents a fee premium of 8.44 percent. The above findings differ from Basioudis and Francis (2007), who have reported significant industry specialist premiums for both the joint leaders (12 percent) as well as the city-specific industry leader alone (19 percent). The results of this study also indicate that the premium for industry leadership in the more recent period in the U.K. is not driven by the office-level industry expertise as shown previously in Basioudis and Francis (2007).

This new U.K. evidence of fee premium for industry leadership is also in contrast to the U.S. and New Zealand where joint industry leadership as well as city industry leadership alone have a differential effect on the Big 4 pricing (Francis *et al*., 2005; Hay and Jeter, 2011), whereas the city industry leadership plays a prominent role. Instead, this current finding is more similar to Australia where fee premium is only reported by the joint industry leader, although the fee premium rate (24 percent) reported in Australia is much higher (Ferguson *et al.*, 2003). Nevertheless, a more recent Australian study by Goodwin and Wu (2014) has reported that the fee premium averages between 10.80 to 12.80 percent, depending on the model specification used in their study. Overall, the premium for joint national and city industry leadership in the U.K. reported in Table 7.1 is still lower when compared to other countries like Australia (between 10.80 percent to 24 percent), the U.S. (18.53 percent) and prior U.K. evidence (12 percent).

In addition, this finding is also in contrast to a study by Choi *et al*. (2010) which uses a continuous measure of industry specialist auditors (instead of indicator variables capturing industry specialisation), and they have found the coefficient of the city-industry specialist to be significant even after controlling for the Big 4 brand name premium and the office size measure, but they report insignificant results for the national measure of industry expertise. Based on Choi *et al.* (2010), this suggests that the city specialist has a more dominant effect than the national specialist on audit pricing in the U.S., even after controlling for the size of the local practice office within an audit firm. Goodwin and Wu (2014) also have reported recently that the city level industry specialist is more important in Australia than national level industry specialist either after having used a continuous market share measure or a dummy variable for designated industry leaders[15]. Numan and Willekens (2012) have also reported that an audit firm which is a city-industry specialist is more dominant than national specialists, as there is evidence of fee premium documented for city-industry specialists even after controlling for the effect of national specialists and the effect of competitive pressure from the closest competitor. Their results are consistent using either the market share or portfolio approach to designate industry specialist auditors[16].

In support of the product differentiation and reputation theory, the results above imply that only the Big 4 audit firms that possess industry leadership at both the national and city level are able to differentiate themselves successfully in the Big 4 audit market, as the market priced their service quality at a higher rate above the Big 4 brand name reputation. In terms of knowledge sharing, the findings reported in Table 7.1, particularly in Model 3, suggest that there is strong knowledge sharing and transferability of industry expertise between the audit offices in the U.K., as being an industry leader at the city level alone or national level alone is not a sufficient condition for the Big 4 firm industry specialists to earn a fee premium.

For the corporate governance variables, in respect of board diversity, the variable *BODFOREIGN* is positive and significant at $p<0.01$ across all the three models, suggesting that companies that have more foreign directors in their board composition pay higher audit fees. This finding supports the argument by Masulis *et al*. (2012) that foreign directors are likely to be less familiar with the U.K. national accounting rules, laws and regulations, governance standards, and management methods, making it more difficult for them to evaluate managerial performance or challenge managerial decisions. The poor monitoring role and poor governance quality of the foreign directors, as described above, might necessitate the auditor to perform extra work to verify the quality of the financial reports prepared by the management, resulting in the charging of higher audit fees. There is no empirical evidence to suggest that the proportion of female directors on boards affects audit fees, as *BODFEM* is not significant at any conventional level. This finding is in contrast to a study by Gul *et al.* (2008) which documented negative association between female directorship and audit fees. The insignificant results could also be attributed to the low percentage of female directors participating in the corporate boards within the sample; as shown in Table 6.1, the average percentage is only 6.7 percent.

[15] Sensitivity analysis is performed later in this study in Section 8.5 to test the robustness of the findings using alternative measures of auditor industry expertise found in the literature (e.g. Mayhew and Wilkins, 2003; Neal and Riley, 2004).
[16] Sensitivity analysis is also performed in Section 8.6 to test the effect of spatial competition on the industry specialisation premium as examined in a prior study by Numan and Willekens (2012).

Although the coefficient for *INTAUD* is positive, it is not significant at any conventional level either. This is in contrast to prior studies which report a significant positive relationship (e.g. Singh and Newby, 2010; Goodwin-Stewart and Kent, 2006) and also a negative relationship (Prawit *et al*., 2009, Felix *et al*., 2001) between internal audit function and audit fees. A possible explanation for this insignificant finding is that there may be a positive relationship between internal audit and audit fees which is not evident because the audit firm absorbs some of the costs of the audit to keep the client while attempting to recover the cost by providing other assurance services to the client in the same year or subsequent years (Singh and Newby, 2010). For the audit committee variables, the coefficients for *ACSIZE*, *ACINDP* and *ACFINEXP* are statistically insignificant at conventional levels in all models in Table 7.1. These insignificant finding could be explained by lack of variation between the sample companies in terms of their audit committee size, independence and financial expertise, given that the authoritative guidance (e.g. Combined Code, 2008; U.K. Corporate Governance Code, 2010) has clearly set the minimum requirement that companies need to meet in respect of these audit committee characteristics. This finding is consistent with the institutional theory, which suggests that the companies' compliance with the regulation is merely ceremonial in nature in order to maintain its legitimacy, without pure intention to exercise their monitoring role effectively. The insignificant finding *ACINDP* is consistent with Carcello *et al*. (2002) and Goodwin-Stewart and Kent (2006), whereas the insignificant finding for *ACFINEXP* is consistent with Carcello and Neal (2003a) and Zaman *et al*. (2011), who did not report any benefit of such expertise. On the other hand, *ACMEET* is positive and significant at p<0.10 (except in Model 2), consistent with the notion that diligence of the audit committee members is associated with more intensive and expensive audits (Carcello *et al*., 2002; Goodwin-Stewart and Kent, 2006; Zaman *et al*., 2011).

Table 7.1: Audit fee regression under firm national-city framework

Panel A: Exclude corporate governance													
		Model 1				Model 2				Model 3			
Variables	**+/-**	**coef.**	**t-stat**	**p-value**	**sig.**	**coef.**	**t-stat**	**p-value**	**sig.**	**coef.**	**t-stat**	**p-value**	**sig.**
Intercept		0.571	5.330	0.000	***	0.513	4.680	0.000	***	0.558	5.110	0.000	***
LNAF	+	0.038	5.610	0.000	***	0.038	5.630	0.000	***	0.038	5.700	0.000	***
LTA	+	0.512	37.310	0.000	***	0.518	37.830	0.000	***	0.512	37.330	0.000	***
SQRTSUBS	+	0.057	10.210	0.000	***	0.057	10.260	0.000	***	0.057	10.170	0.000	***
ROI	-	-0.115	-2.510	0.006	***	-0.106	-2.290	0.011	**	-0.116	-2.570	0.005	***
DE	+	-0.165	-2.600	0.005	***	-0.187	-2.960	0.002	***	-0.166	-2.630	0.005	***
FOREIGN	+	0.158	7.020	0.000	***	0.153	6.740	0.000	***	0.155	6.930	0.000	***
QUICK	-	-0.009	-4.070	0.000	***	-0.009	-3.880	0.000	***	-0.009	-3.960	0.000	***
CATA	+	0.124	2.650	0.004	***	0.126	2.660	0.004	***	0.127	2.700	0.004	***
OPINION	+	0.071	1.480	0.070	*	0.083	1.750	0.040	**	0.073	1.500	0.067	*
LONDON	+	0.082	5.000	0.000	***	0.084	5.010	0.000	***	0.084	5.070	0.000	***
BUSY	+	0.082	4.910	0.000	***	0.085	5.110	0.000	***	0.083	4.950	0.000	***
LOSS	+	0.016	0.600	0.274		0.016	0.610	0.271		0.012	0.440	0.330	
INITIAL	-	-0.086	-3.650	0.000	***	-0.086	-3.590	0.000	***	-0.081	-3.390	0.001	***
INSOWN	-	-0.006	-0.600	0.273		-0.007	-0.740	0.230		-0.005	-0.550	0.291	
<u>*Industry Specialist Auditor*</u>													
NAT #1(n=322)		0.063	3.970	0.000	***								
CITY#1 (n=410)						0.048	2.420	0.016	**				
JOINT_NAT# 1-CITY#1 (n=278)										0.081	3.650	0.000	***
CITY#1_ONLY (n=132)										0.018	0.820	0.411	
NAT#1_ONLY (n=44)										-0.062	-0.850	0.397	
Year fixed-effects		Included				Included				Included			
Industry fixed-effects		Included				Included				Included			
R^2		0.873				0.872				0.873			
N		892				892				892			
Panel B: Include corporate governance													
Variables	**+/-**	**coef.**	**t-stat**	**p-value**	**sig.**	**coef.**	**t-stat**	**p-value**	**sig.**	**coef.**	**t-stat**	**p-value**	**sig.**
Intercept		0.867	5.980	0.000	***	0.803	5.440	0.000	***	0.890	6.110	0.000	***
LNAF	+	0.037	5.600	0.000	***	0.037	5.650	0.000	***	0.037	5.690	0.000	***
LTA	+	0.476	25.910	0.000	***	0.482	26.340	0.000	***	0.473	25.620	0.000	***
SQRTSUBS	+	0.058	10.740	0.000	***	0.058	10.780	0.000	***	0.058	10.840	0.000	***
ROI	-	-0.116	-2.550	0.006	***	-0.105	-2.280	0.012	**	-0.115	-2.510	0.006	***
DE	+	-0.086	-1.460	0.073	*	-0.108	-1.820	0.034	**	-0.084	-1.390	0.082	*
FOREIGN	+	0.140	6.420	0.000	***	0.134	6.130	0.000	***	0.137	6.290	0.000	***
QUICK	-	-0.010	-3.920	0.000	***	-0.009	-3.750	0.000	***	-0.010	-3.990	0.000	***

Table 7.1: Audit fee regression under firm national-city framework (continued)

Panel B: Include corporate governance													
Variables	**+/-**	**coef.**	**t-stat**	**p-value**	**sig.**	**coef.**	**t-stat**	**p-value**	**sig.**	**coef.**	**t-stat**	**p-value**	**sig.**
CATA	+	0.162	3.650	0.000	***	0.165	3.660	0.000	***	0.162	3.650	0.000	***
OPINION	+	0.049	1.050	0.147		0.059	1.270	0.102		0.048	1.020	0.155	
LONDON	+	0.059	3.570	0.000	***	0.060	3.530	0.000	***	0.058	3.480	0.001	***
BUSY	+	0.066	3.970	0.000	***	0.069	4.160	0.000	***	0.065	3.890	0.000	***
LOSS	+	0.007	0.250	0.401		0.007	0.250	0.403		0.006	0.210	0.418	
INITIAL	-	-0.078	-3.380	0.001	***	-0.077	-3.310	0.001	***	-0.077	-3.300	0.001	***
INSOWN	-	-0.003	-0.360	0.360		-0.004	-0.450	0.327		-0.003	-0.350	0.365	
<u>*Industry Specialist Auditor*</u>													
NAT #1(n=322)		0.059	3.700	0.000	***								
CITY#1 (n=410)						0.043	2.800	0.005	***				
JOINT_NAT# 1-CITY#1 (n=278)										0.068	3.860	0.000	***
CITY#1_ONLY (n=132)										-0.002	-0.070	0.945	
NAT#1_ONLY (n=44)										0.008	0.200	0.839	
<u>*Corporate Governance*</u>													
BODFEM		-0.010	-0.870	0.386		-0.011	-1.020	0.310		-0.010	-0.930	0.353	
BODFOREIGN		0.081	6.530	0.000	***	0.084	6.820	0.000	***	0.081	6.550	0.000	***
INTAUD		0.037	1.560	0.120		0.032	1.360	0.175		0.035	1.470	0.141	
ACSIZE		-0.004	-0.370	0.713		-0.002	-0.140	0.886		-0.004	-0.380	0.701	
ACINDP		0.012	0.790	0.428		0.013	0.830	0.404		0.010	0.640	0.521	
ACFINEXP		0.014	1.440	0.151		0.014	1.440	0.150		0.014	1.430	0.154	
ACMEET		0.019	1.770	0.076	*	0.017	1.550	0.123		0.019	1.770	0.078	*
Year fixed-effects			Included				Included				Included		
Industry fixed-effects			Included				Included				Included		
R^2			0.881				0.880				0.881		
N			892				892				892		

*** are significant at p<0.01, ** are significant at p<0.05 and *at p<0.10. All p-values are one-tailed, except for the industry specialist auditor and corporate governance variables which are two-tailed. Industry fixed-effects and year fixed-effects are not reported for brevity, and t-statistics and significance levels are calculated using the White (1980) robust standard errors to correct for heteroscedasticity. Refer Table 5.8 for definition of variables.

7.2.2 Partner national-city framework

Analysing the effect of audit partner industry specialisation in this section provides empirical results for an issue that has not been explored in the U.K.. Audit partner data has recently become available in the U.K., and this is the first study to explore this important issue in the U.K. in relation to audit fees and auditor industry specialisation using the national-city framework.

Table 7.3 below presents the results of the analysis on the effect of audit partner industry specialisation and corporate governance on audit fees. The approach used for the analysis is similar to the national-city framework, discussed in the preceding section of this chapter, where Model 1 and Model 2 test the effect of national audit partner industry leadership per se and city audit partner industry leadership per se on audit pricing respectively, without controlling for joint national and city-specific audit partner industry leadership. Model 3, on the other hand, tests the pricing of national and city-specific industry leadership while controlling for the joint effect of national and city-specific industry leadership of the audit partners.

The results in Table 7.3 below are derived from 680 observations, where the sample size is accomplished after excluding 212 observations with missing audit partner data from the audit firm national city framework sample used in previous analysis (N=892) in Table 7.1 below. This missing audit partner data is because the requirement for disclosure of the name of the senior statutory auditor (or engagement partner) signing off the auditor’s report for and on behalf of the audit firm was only made mandatory in the U.K. for financial years beginning on or after 6 April 2008 (Section 503 of Companies Act 2006). The starting point for the construction of the sample in this study is the year 2008, and, therefore, some listed companies would not have adopted the new regulation early enough. This has led to 212 company observations being dropped from the original sample. Table 7.2 reports the distribution of market shares among the audit partners at the national and city level.

The results in Panel A of Table 7.3 present the regression results before the inclusion of corporate governance variables, whereas in Panel B, the regression results are tabulated with the inclusion of the corporate governance variables to determine the effect of corporate governance on the industry specialist premium. Once they are controlled for in the model, the models explanatory power (R^2) has increased from 90.3 percent (R^2 for Model 3 in Panel A) to 90.9 percent R^2 for Model 3 in Panel B). However, the coefficient of the fee premium for the partner who is a joint national and city industry specialist remained the same at 0.353 at $p<0.01$, suggesting that corporate governance characteristics of the firm do not have any effect on the monitoring role of the industry specialist auditor at the partner level. The significance of the results for the control variables and industry specialist auditor variables in Panel A and Panel B is qualitatively the same, except that *DE* has lost its significance in Panel B. The final results are interpreted based on the outcome of Panel B.

In respect of the control variables, *LNAF*, *LTA*, *SQRTSUBS*, *FOREIGN*, *QUICK*, *CATA*, *LONDON*, *BUSY*, *INITIAL* are significant at the conventional levels and in the expected direction, except for *DE* which is significant but in the opposite direction than predicted. The variables *LOSS*, *OPINION* and *INSOWN* are insignificant at p=0.10. The results reported for the control variables are consistent with what has been reported in Table 7.1 earlier under the firm national-city framework analysis. Overall, the results of the control variables support the notion that clients' characteristics such as client size (*LTA*), complexity (*SQRTSUBS*, *FOREIGN*), inherent risk (*CATA*, *QUICK*), and the auditor production costs (*BUSY*, *LNAF*, *LONDON*, *INITIAL*) affect audit risk and audit effort, contributing to the variation in the level of audit fees (Hay *et al*., 2006).

As before, the estimation of Model 1 is an iterative process, starting with only one indicator variable for the nationally top-ranked partner in the first estimation, and then adding a second indicator variable for the second-ranked partner in the second estimation, and so on until the introduction of an additional ranking partner is not statistically significant. This iterative process has resulted in only the nationally top six partners having a significant fee premium relative to the remaining Big 4 partners. Based on the estimations performed (not tabulated), the auditor indicator variable for the six top ranked partners nationally are found to be significant as when the specification is estimated with an additional auditor indicator variable for the seventh-ranked partner in the industry, the result then becomes insignificant. Table 7.2 Panel A presents the coefficients, p-values, average fee premiums and average market shares of audit fees for the top-six audit partner national industry leadership. The fee premium for the top, second, third, fourth, fifth and sixth-ranked audit partner averages at 88.32 percent, 57.93 percent, 52.20 percent, 22.38 percent, 17.12 percent, and 13.97 percent, respectively. A series of F-tests indicates there are only significant differences in the average fee premium between the top-ranked partner and second-ranked partner (F-statistic=38.39, p=0.000) as well as between the third ranked partner and fourth ranked partner (F-statistic=29.07, p=0.000).

As shown in Panel A of Table 7.2, the huge gap reported between the fee premium of the top-ranked and second-ranked partner as well as between the third ranked and the fourth ranked partner is consistent with the distance in the market share based on audit fees between these leaders. Thus, the results for Model 1 reported in Table 7.3 below use a single auditor indicator variable that takes on the value of 1 if the audit partners are ranked in the top six nationally (*PARNAT#6*) and tests the effect of their national-level industry leadership per se on differential Big 4 audit pricing for N=207 observations in which the Big 4 partner is the national industry leader, and the default comparison group is all of the remaining 473 observations not having Big 4 audit partners who are the top six industry leaders nationally. As shown in Panel B of Table 7.3, the *PARNAT#6* coefficient value is 0.263 and significant at p<0.01, which equates to an average audit fee premium of 31.26 percent. This premium is higher than the one reported by Zerni (2011) in Sweden, where the audit partners who are industry specialists (measured using either the aggregate amount of audited total assets or the aggregate number of engagements, but not using audit fees) earns an average of 15.40 percent higher fees than their non-specialist counterparts.

Table 7.2: Data on partner industry leadership

Panel A: National industry leadership

	Coefficient	p-value	Average fee premium (%)	Average market share based on audit fees (%)
Top-ranked	0.633	0.000	88.32	40
Second-ranked	0.457	0.000	57.93	19
Third-ranked	0.420	0.000	52.20	10
Fourth-ranked	0.202	0.000	22.38	6
Fifth-ranked	0.158	0.000	17.12	4
Sixth-ranked	0.131	0.002	13.97	3

Panel B: City industry leadership

	Coefficient	p-value	Average fee premium (%)	Average market share based on audit fees (%)
Top-ranked	0.096	0.000	10.07	60
Second-ranked	0.047	0.015	4.81	27
Third-ranked	0.052	0.031	5.34	14

Model 2 in Panel B of Table 7.3 below tests the effect of city-specific partner industry leadership on audit pricing, without controlling for the joint national and city partner industry leadership effect. The estimation of Model 2 follows the same iterative process, starting with the top-ranked partner at the city-industry level in the first estimation, and adding a second, third and fourth-ranked city-industry partner in the following estimations step by step. The results (not tabulated) indicate that only the top, second, and third-ranked partner have significant fee premiums relative to other Big 4 partners who are not city level industry leaders, but this is not so for the fourth-ranked partner. As shown in Panel B of Table 7.2 above, the fee premium for the top-ranked, second-ranked and third-ranked city-industry specialist partners averages at 10.07 percent, 4.81 percent, and 5.34 percent, respectively. An *F*-test indicates there is only a significant difference between the coefficients for the top-ranked and second-ranked city-industry partners (*F*-statistic=4.56, *p*=0.033), whereas the coefficients for the second-ranked and third-ranked city-industry partner are not significantly different (*F*-statistic=0.020, *p*=0.874). This finding seems to be consistent with the huge gap in market shares, based on audit fees, between the top-ranked and second-ranked city-industry partner at 60 percent and 27 percent, respectively. Thus, the results for Model 2 reported in Panel B of Table 7.3 below use a single auditor indicator variable coded 1 if the partner is ranked in the top three for city-level industry leadership (*PARCITY#3*) and tests the effect of partner city-specific leadership per se for N=400 observations in which the Big 4 auditor is the top three city-specific industry leader, and the default comparison group is the remaining 280 observations not audited by the city-specific partner who is not an industry leader. The coefficient value for *PARCITY#3* is 0.072 and significant (*p*<0.01), which equates to an average audit fee premium of 7.46 percent for the top three partners. Note that the partner city-industry leadership premium in Model 2 (7.46 percent) is less than the national leadership premium in Model 1 (31.26 percent).

Model 3 tests the pricing of national and city-specific audit partner industry leadership while controlling for the joint effect of the audit partner industry leadership at the national and city-industry level. The first auditor indicator variable is coded 1 for 143 observations (21.03 percent of the sample) in which the partner is both the six top-ranked national leader and the top three city-industry leader; the second auditor indicator variable is coded 1 for 257 observations (37.79 percent of the sample) in which the partner is a top three city-industry leader but not a top six national leader, and the third auditor indicator variable is coded 1 for 64 observations (9.41 percent of the sample) in which the partner is a top six national industry leader but not a top three city-industry leader.

In other words, companies audited by partners who are national industry leaders (N=207) can be decomposed into those whose partners are joint national and city-specific industry leaders (N=143) and those audited by national leaders alone (N=64). Similarly, companies audited by partners who are city-specific industry leaders (N=400) can be decomposed into those audited by joint national and city-specific industry leaders (N=143) and city-specific industry leaders alone (N=257). The purpose of these three partitions is to test for the separate effects of partner national and city-specific industry leadership on audit pricing, as well as to isolate the joint effect of partner national and city-specific industry leadership on pricing. The default comparison group is the 216 observations (31.77 percent of the sample) in which the partner is neither a national nor a city industry leader.

The results of Model 3 in Table 7.3 below show that the partner who is an industry leader at both the national and city-industry level, and also the partner leaders at the national level only, are able to extract fee premiums from their clients relative to other Big 4 partners who are non-leaders. The coefficient for *PARJOINT_PARNAT#6-PARCITY#3* is 0.353 and is significant at $p<0.01$, which equates to an average fee premium of 42.33 percent. The coefficient for *PARNAT#6_ONLY* is 0.145 and is significant at $p<0.01$, which represents a premium of 15.60 percent. An F-test indicates that there is a significant difference between the coefficients (F-statistic=41.49, p=0.000) for the joint national and city audit partner (PAR*JOINT_PARNAT#6-PARCITY3)* and the national partner alone (*PARNAT#6_ONLY).* While all national leader partners are able to extract a fee premium (15.60 percent), the fee premium is 26.73 percent higher for the city-industry partners who are also leaders at the national level (42.33 percent). This finding indicates that the fee premium for industry specialisation is driven by the partner industry leadership at the national level, as it represents an important condition for the fee premium to be charged. This study is the first to represent such an empirical finding, considering the joint effect of the partner industry leadership at the national and city level.

It is important to note that the magnitude of the fee premium reported for the partner in all of the models under the partner national-city framework analysis (Table 7.3) is larger when compared to the audit firm industry leadership premium under the firm national-city framework analysis (Table 7.1). This is because the fee premium for the audit firm who is an industry leader comprised of a portfolio of clients audited by the audit firm within that particular industry, whereas, the fee premium of the partner is driven only by his/her individual clienteles. An audit firm (or a local practice office of an audit firm) could have more than one engagement partner administering the audits of the firm or office. While an audit firm could hold a leadership position in a particular industry either at the national or city level, not all of the partners residing within that audit firm (or local audit office) are industry leaders. Thus, not all audit engagements and audit reports of the clients of an industry leading audit firm (or an industry specialist audit office) are monitored and signed by an industry leading partner. For instance, Partner A and Partner B are both from PwC located in Birmingham. PwC, as an audit firm, is a city-industry leader in the manufacturing industry in Birmingham. However, Partner A has a higher market share of audit fees relative to partner B within that manufacturing industry. Thus, Partner A may be designated as the industry leader in Birmingham but not Partner B. Under the partner national-city framework analysis, the study only examines the existence and magnitude of fee premiums of the industry leading partners. Whereas, under the firm national-city framework, the study examined the existence and magnitude of fee premiums of the industry leading audit firms, where any fee premium or discount reported in the analysis represents the aggregate fee premium or discount of all the partners attached to the audit firm, either at the national or office level.

For the corporate governance variables, the results reported in Panel B of Table 7.3 under the partner national-city framework are consistent with the ones reported earlier using the t firm joint national-city framework in Table 7.1. Only *BODFOREIGN* and *ACMEET* are significant at $p<0.05$, except for in Model 2, where ACMEET is insignificant. Other corporate governance variables (*BODFEM, INTAUD, ACSIZE, ACINDP, ACFINEXP*) are not significant at any conventional levels.

Table 7.3: Audit fee regression under partner national-city framework

Panel A: Exclude corporate governance													
		Model 1				**Model 2**				**Model 3**			
Variables	**+/-**	**coef.**	**t-stat**	**p-value**	**sig.**	**coef.**	**t-stat**	**p-value**	**sig.**	**coef.**	**t-stat**	**p-value**	**sig.**
Intercept		1.191	9.220	0.000	***	0.546	4.630	0.000	***	1.349	10.330	0.000	***
LNAF	+	0.036	4.680	0.000	***	0.040	4.610	0.000	***	0.035	4.690	0.000	***
LTA	+	0.436	27.460	0.000	***	0.505	33.030	0.000	***	0.417	26.650	0.000	***
SQRTSUBS	+	0.056	9.600	0.000	***	0.066	10.510	0.000	***	0.057	10.000	0.000	***
ROI	-	-0.091	-1.770	0.038	**	-0.120	-2.200	0.014	**	-0.053	-1.030	0.153	
DE	+	-0.134	-1.980	0.025	**	-0.181	-2.500	0.007	***	-0.115	-1.700	0.045	**
FOREIGN	+	0.124	5.100	0.000	***	0.160	6.140	0.000	***	0.112	4.790	0.000	**
QUICK	-	-0.010	-3.350	0.001	***	-0.009	-2.910	0.002	***	-0.011	-3.440	0.001	***
CATA	+	0.091	1.860	0.032	**	0.095	1.830	0.034	**	0.097	2.040	0.021	**
OPINION	+	0.049	1.080	0.140		0.079	1.550	0.061	*	0.051	1.120	0.132	
LONDON	+	0.093	5.380	0.000	***	0.102	5.350	0.000	***	0.087	4.920	0.000	***
BUSY	+	0.058	3.430	0.001	***	0.066	3.560	0.000	***	0.055	3.260	0.001	***
LOSS	+	0.027	1.030	0.152		0.032	1.140	0.128		0.032	1.240	0.108	
INITIAL	-	-0.093	-3.730	0.000	***	-0.108	-3.880	0.000	***	-0.089	-3.610	0.000	***
INSOWN	-	0.005	0.560	0.289		-0.002	-0.160	0.437		0.008	0.840	0.201	
Industry Specialist Auditor													
PARNAT #6 (n=207)		0.272	10.590	0.000	***								
PARCITY#3 (n=400)						0.072	3.800	0.000	***				
PARJOINT_ PARNAT#6-PARCITY#3 (n=143)										0.353	11.630	0.000	***
PARCITY#3_ONLY (n=257)										-0.013	-0.620	0.532	
PARNAT#6_ONLY (n=64)										0.155	4.840	0.000	***
Year fixed-effects		Included				Included				Included			
Industry fixed-effects		Included				Included				Included			
R^2		0.897				0.879				0.903			
N		680				680				680			

Panel B: Include corporate governance													
Variables	**+/-**	**coef.**	**t-stat**	**p-value**	**sig.**	**coef.**	**t-stat**	**p-value**	**sig.**	**coef.**	**t-stat**	**p-value**	**sig.**
Intercept		1.437	8.840	0.000	***	0.816	5.280	0.000	***	1.631	10.030	0.000	***
LNAF	+	0.034	4.610	0.000	***	0.037	4.540	0.000	***	0.033	4.610	0.000	***
LTA	+	0.408	20.630	0.000	***	0.474	24.480	0.000	***	0.384	19.630	0.000	***
SQRTSUBS	+	0.056	9.590	0.000	***	0.066	10.680	0.000	***	0.056	9.930	0.000	***
ROI	-	-0.075	-1.420	0.078	*	-0.111	-2.000	0.023	**	-0.039	-0.760	0.225	
DE	+	-0.078	-1.230	0.110		-0.114	-1.670	0.048	**	-0.061	-0.960	0.168	
FOREIGN	+	0.107	4.570	0.000	***	0.139	5.560	0.000	***	0.092	4.060	0.000	***
QUICK	-	-0.011	-3.290	0.001	***	-0.009	-2.850	0.002	***	-0.011	-3.390	0.001	***
CATA	+	0.127	2.680	0.004	***	0.136	2.710	0.004	***	0.129	2.800	0.003	***

Table 7.3: Audit fee Regression under partner national-city framework (continued)

Panel B: Include corporate governance (continued)

Variables	**+/-**	**coef.**	**t-stat**	**p-value**	**sig.**	**coef.**	**t-stat**	**p-value**	**sig.**	**coef.**	**t-stat**	**p-value**	**sig.**
OPINION	+	0.021	0.460	0.322		0.046	0.910	0.181		0.024	0.550	0.292	
LONDON	+	0.071	4.070	0.000	***	0.077	3.990	0.000	***	0.066	3.730	0.000	***
BUSY	+	0.045	2.610	0.005	***	0.051	2.790	0.003	***	0.039	2.330	0.010	**
LOSS	+	0.020	0.730	0.232		0.023	0.810	0.210		0.025	0.950	0.172	
INITIAL	-	-0.086	-3.610	0.000	***	-0.098	-3.630	0.000	***	-0.079	-3.420	0.001	***
INSOWN	-	0.008	0.870	0.194		0.002	0.230	0.408		0.012	1.250	0.106	
<u>*Industry Specialist Auditor*</u>													
PARNAT #6 (n=207)		0.263	10.330	0.000	***								
PARCITY#3 (n=400)						0.072	3.840	0.000	***				
PARJOINT_ PARNAT#6-PARCITY#3 (n=143)										0.353	11.280	0.000	***
PARCITY#3_ONLY (n=257)										-0.011	-0.530	0.594	
PARNAT#6_ONLY (n=64)										0.145	4.700	0.000	***
<u>*Corporate Governance*</u>													
BODFEM		-0.012	-1.000	0.319		-0.008	-0.600	0.549		-0.013	-1.130	0.260	
BODFOREIGN		0.067	5.320	0.000	***	0.080	5.790	0.000	***	0.067	5.470	0.000	***
INTAUD		0.011	0.470	0.636		0.022	0.900	0.369		0.024	1.060	0.290	
ACSIZE		0.008	0.700	0.487		0.004	0.290	0.769		0.007	0.650	0.514	
ACINDP		0.011	0.650	0.515		0.015	0.860	0.389		0.004	0.240	0.810	
ACFINEXP		0.011	1.020	0.309		0.010	0.930	0.353		0.000	-0.040	0.968	
ACMEET		0.022	2.040	0.042	**	0.015	1.270	0.206		0.028	2.670	0.008	***
Year fixed-effects			Included				Included				Included		
Industry fixed-effects			Included				Included				Included		
R^2			0.903				0.887				0.909		
N			680				680				680		

*** are significant at p<0.01, ** are significant at p<0.05 and *at p<0.10. All p-values are one-tailed, except for the industry specialist auditor and corporate governance variables which are two-tailed. Industry fixed-effects and year fixed-effects are not reported for brevity, and t-statistics and significance levels are calculated using the White (1980) robust standard errors to correct for heteroscedasticity. Refer Table 5.8 for definition of variables.

7.2.3 Joint firm-partner national-city framework

While the results in the audit firm and audit partner national and city framework analyses in the preceding two sections of this chapter provide evidence of premiums earned by the industry specialists either at the audit firm or the partner level, there is a possibility that those results are distorted due to omitted variable bias. For instance, Table 7.1 earlier indicates that there is a premium attributed to the audit firm industry leadership at the national and city-industry level. However, the models in Table 7.1 did not control for the confounding effect of audit partner industry leadership in their analysis. The same can be applied to the results in Table 7.3, where the confounding effect of the audit firm industry leadership was not controlled for in the audit partner industry leadership analysis.

Thus, there is a possibility that the reported premiums based on merely the audit firm industry leadership per se in Table 7.1 and audit partner industry leadership per se in Table 7.3, presented in the preceding sections of this chapter, may be overstated due to the confounding effect of failure to control for the effect of one another in the respective models. To correct for this effect, this study extends the analysis further, by adopting the joint firm-partner national-city industry framework. Again, as in the audit partner specialisation analysis in the preceding section, this study contributes to the auditor industry specialisation literature, as it is the first study that explores the effect of the joint firm-partner national-city framework in its analyses on audit pricing. The following paragraphs describe the analysis and the results when specifically the joint firm-partner national-city industry specialisation is taken into consideration. This joint firm-partner national-city framework represents another approach to testing whether within-office knowledge sharing exists. The following analysis combines both the effect of audit firm and audit partner industry leadership at the national and city industry level, and tests them simultaneously to determine which type of industry leadership is more important (audit firm versus. audit partner), and which yields the highest fee premium.

The combinations of the firm national-city framework and partner national-city framework results in the creation of 15 new variables to be examined under the joint firm-partner national-city framework analysis. These variables are described in detail in Table 7.4 below. Given that the sample size for the joint firm-partner national-city framework is N=680, then the default comparison group is N=150, and is comprised of both audit firms and partners who are not leaders either at the national or at the city-industry level.

Table 7.4: Definition of industry specialist auditor variables under the joint firm-partner national-city framework

Variable	*N*	Variable definition
NAT#1-CITY#1_PARNAT#6-PARCITY#3	76	Indicator variable = 1 if the *audit firm* is the first ranked by market share nationally (*NAT#1*), the *office* is the top-ranked by city-industry market share (*CITY#1*), the *audit partner* is in the top six ranked by market share nationally (*PARNAT#6*), and the *audit partner* is in the top three ranked by city-industry market share (*PARCITY#3*), and zero otherwise
NAT#1-CITY#1_PARNAT#0-PARCITY#3	70	Indicator variable = 1 if the *audit firm* is the first ranked by market share nationally (*NAT#1*), the *office* is the top-ranked by city-industry market share (*CITY#1*), the *audit partner* is not in the top six ranked by market share nationally (*PARNAT#0*), and the *audit partner* is in the top three ranked by city-industry market share (*PARCITY#3*), and zero otherwise
NAT#1-CITY#0_PARNAT#6-PARCITY#3	2	Indicator variable = 1 if the *audit firm* is the first-ranked by market share nationally (*NAT#1*), the *office* is not the top-ranked by city-industry market share (*CITY#0*), the *audit partner* is in the top six ranked by market share nationally (*PARNAT#6*), and the *audit partner* is in the top three ranked by city-industry market share (*PARCITY#3*), and zero otherwise
NAT#1-CITY#0_PARNAT#0-PARCITY#3	28	Indicator variable = 1 if the *audit firm* is the first-ranked by market share nationally (*NAT#1*), the *office* is not the top-ranked by city-industry market share (*CITY#0*), the *audit partner* is not in the top six ranked by market share nationally (*PARNAT#0),* and the *audit partner* is in the top three ranked by city-industry market share (*PARCITY#3*), and zero otherwise
NAT#0-CITY#1_PARNAT#6-PARCITY#3	16	Indicator variable = 1 if the *audit firm* is not the first-ranked by market share nationally (*NAT#0*), the *office* is in the top two ranked by city-industry market share (*CITY#1*), the *audit partner* is in the top six ranked by market share nationally (*PARNAT#6*), and the *audit partner* is in the top three ranked by city-industry market share (*PARCITY#3*), and zero otherwise
NAT#0-CITY#1_PARNAT#0-PARCITY#3	77	Indicator variable = 1 if the *audit firm* is not the first-ranked by market share nationally (*NAT#0*), the *office* is the top-ranked by city-industry market share (*CITY#1*), the *audit partner* is not in the top six ranked by market share nationally (*PARNAT#0*), and the *audit partner* is in the top three ranked by city-industry market share (*PARCITY#3*), and zero otherwise
NAT#0-CITY#0_PARNAT#6-PARCITY#3	49	Indicator variable = 1 if the *audit firm* is not the first-ranked by market share nationally (*NAT#0*), the *office* is not the top-ranked by city-industry market share (*CITY#0*), the *audit partner* is in the top six ranked by market share nationally (*PARNAT#6*), and the *audit partner* is in the top three ranked by city-industry market share (*PARCITY#3*), and zero otherwise
NAT#0-CITY#0_PARNAT#0-PARCITY#3	82	Indicator variable = 1 if the *audit firm* is not the first-ranked by market share nationally (*NAT#0*), the *office* is not the top-ranked by city-industry market share (*CITY#0*), the *audit partner* is not in the top six ranked by market share

		nationally (*PARNAT#0*), and the *audit partner* is in the top three ranked by city-industry market share (*PARCITY#3*), and zero otherwise
NAT#1-CITY#1_PARNAT#6-PARCITY#0	12	Indicator variable = 1 if the *audit firm* is the first-ranked by market share nationally (*NAT#*1), the *office* is the top-ranked by city-industry market share (*CITY#1*), the *audit partner* is in the top six ranked by market share nationally (*PARNAT#6*), and the *audit partner* is not in the top three ranked by city-industry market share (*PARCITY#0*), and zero otherwise
NAT#1-CITY#1_PARNAT#0-PARCITY#0	51	Indicator variable = 1 if the *audit firm* is the first ranked by market share nationally (*NAT#1*), the *office* is the top-ranked by city-industry market share (*CITY#1*), the *audit partner* is not in the top six ranked by market share nationally (*PARNAT#0*), and the *audit partner* is not in the top three ranked by city-industry market share (*PARCITY#0*), and zero otherwise
NAT#1-CITY#0_PARNAT#6-PARCITY#0	1	Indicator variable = 1 if the *audit firm* is the first-ranked by market share nationally (*NAT#1*), the *office* is not the top-ranked by city-industry market share (*CITY#0*), the *audit partner* is in the top six ranked by market share nationally (*PARNAT#6*), and the *audit partner* is not in the top three ranked by city-industry market share (*PARCITY#0*), and zero otherwise
NAT#1-CITY#0_PARNAT#0-PARCITY#0	5	Indicator variable = 1 if the *audit firm* is the first-ranked by market share nationally (*NAT#1*), the *office* is not the top-ranked by city-industry market share (*CITY#0*), the *audit partner* is not in the top six ranked by market share nationally (*PARNAT#0*), and the *audit partner* is not in the top three ranked by city-industry market share (*PARCITY#0*), and zero otherwise
NAT#0-CITY#1_PARNAT#6-PARCITY#0	1	Indicator variable = 1 if the *audit firm* is not the first-ranked by market share nationally (*NAT#0*), the *office* is the top-ranked by city-industry market share (*CITY#1*), the *audit partner* is in the top six ranked by market share nationally (*PARNAT#6*), and the *audit partner* is not in the top three ranked by city-industry market share (*PARCITY#0*), and zero otherwise
NAT#0-CITY#1_PARNAT#0-PARCITY#0	10	Indicator variable = 1 if the *audit firm* is not the first-ranked by market share nationally (*NAT#0*), the *office* is the top-ranked by city-industry market share (*CITY#1*), the *audit partner* is not in the top six ranked by market share nationally (*PARNAT#0*), and the *audit partner* is not in the top three ranked by city-industry market share (*PARCITY#0*), and zero otherwise
NAT#0-CITY#0_PARNAT#6-PARCITY#0	50	Indicator variable = 1 if the *audit firm* is not the first-ranked by market share nationally (*NAT#0*), the *office* is not the top-ranked by city-industry market share (*CITY#0*), the *audit partner* is in the top six ranked by market share nationally (*PARNAT#6*), and the *audit partner* is not in the top three ranked by city-industry market share (*PARCITY#0*), and zero otherwise

Panel A in Table 7.5 presents the regression results before the inclusion of corporate governance variables, whereas in Panel B, the regression results are tabulated with the inclusion of the corporate governance variables to determine the effect of corporate governance function on the industry specialist premium[2]. Once they are controlled for in the model, the models explanatory power (R^2) has increased from 90.7 percent to 91.3 percent, and there is a slight change in the fee premium for the industry specialist auditor, which indicates that corporate governance characteristics of a firm may explain a considerable portion of the auditor industry specialist premium and variation in audit fees. The significance of the results for the control variables and industry specialist auditor variables in Panel A and Panel B are qualitatively the same. The final results are interpreted below based on the outcomes in Panel B. Variables *LNAF, LTA, SQRTSUBS, FOREIGN, QUICK, CATA, LONDON, BUSY* and *INITIAL* are significant at conventional levels and in the expected direction, except for *ROI, DE, OPINION, LOSS and INSOWN,* which are insignificant. These findings are consistent with the ones reported earlier under the partner national-city framework (see Table 7.3).

In respect of the variables of interest that capture various combinations of auditor industry specialisation measures, the coefficient for *NAT#1-CITY#1_PARNAT#6-PARCITY#3, NAT#0-CITY#1_PARNAT#6-PARCITY#3, NAT#0-CITY#0_PARNAT#6-PARCITY#3, NAT#1-CITY#1_PARNAT#6-PARCITY#0, NAT#1-CITY#1_PARNAT#0-PARCITY#0,* and *NAT#0-CITY#0_PARNAT#6-PARCITY#0* are positive and significant at $p<0.01$, suggesting evidence of fee premiums when the audit partner is an industry leader either at the national or city-industry level[17]. The fee premium is the highest when the both the firm and the partner are the industry leader at both the national and city level (coefficient for *NAT#1-CITY#1_PARNAT#6-PARCITY#3* = 0.438) and the lowest when the fee premium is driven by partner national industry leadership alone (coefficient for *NAT#0-CITY#0_PARNAT#6-PARCITY#0*=0.152) Thus, the average fee premium reported in Table 7.5 ranges between 54.96 percent and 16.42 percent. Interestingly, when a partner is a joint national and city-industry leader, a fee premium is still earned, despite working in an audit firm that is not a leader in the industry (coefficient for *NAT#0-CITY#0_PARNAT#6-PARCITY#3* = 0.347, $p<0.01$). Besides that, there is also evidence of fee premiums for firm joint national and city industry leadership, in the absence of partner industry leadership (coefficient for *NAT#1-CITY#1_PARNAT#0-PARCITY#0*=0.090, $p<0.01$), indicating that firm national industry leadership alone is also a sufficient condition to earn a fee premium. However, the fee premium is lower and averages at 9.42 percent. Despite the finding that differentiation in fee premium is mainly affected by the level of industry expertise possessed by the audit partner, and the fact that non-leading partners (*NAT#1-CITY#1_PARNAT#0-PARCITY#0*) within these leading firms are still able to charge a fee premium, suggest the existence of knowledge sharing and transfer of industry expertise between the partners within the Big 4 audit firms.

[17] Although *NAT#1-CITY#0_PARNAT#6-PARCITY#0* and *NAT#0-CITY#1_PARNAT#6-PARCITY#0* are also positively significant at p<0.01, the number of observations (N=1) is too small to warrant a conclusion on these observations *per se*. Thus, the results are interpreted with caution.

Given that variable *NAT#0-CITY#0_PARNAT#6-PARCITY#0* is positive and significant at $p<0.01$, this indicates that partner reputation at the national level (*PARNAT#6*) matters the most in the U.K. audit market and it is a necessary condition for a fee premium above and beyond an audit firm industry leadership. In addition, all the insignificant variables (*NAT#1-CITY#1_PARNAT#0-PARCITY#3, NAT#1-CITY#0_PARNAT#0-PARCITY#3, NAT#0-CITY#1_PARNAT#0-PARCITY#3, NAT#0-CITY#0_PARNAT#0-PARCITY#3, NAT#1-CITY#0_PARNAT#0-PARCITY#0, NAT#0-CITY#1_PARNAT#0-PARCITY#0*) represent conditions where the partner is not a national industry leader, further emphasizing this conclusion. This empirical finding supports earlier results in Table 7.3 under the partner national-city framework which indicates that partner industry leadership alone (*PARNAT#6_ONLY*) is a sufficient condition to earn a fee premium.

In a similar vein, a study in Australia by Goodwin and Wu (2014) reported evidence of premiums only for companies audited by partners who are industry leaders at the city level, suggesting that partner level expertise is the driver of the audit fee premium for industry expertise and that there is no auditor industry expertise fee premium at the audit office level when partner level expertise is controlled for. Their results are consistent when they control for either the first-ranked, top two or the top three ranked city partners. However, Goodwin and Wu (2014) do not control for the partner industry leadership at the national level in their analysis. Hence, their results could be biased due to failure to control for this confounding effect. This study takes a step further to solve this confounding effect issue prevalent in Goodwin and Wu (2014) and contributes to the auditor industry special*6*isation literature by introducing, for the first time, the joint firm-partner national-city framework analysis.

Interestingly, under the joint firm-partner national-city framework analysis, in contrast to Goodwin and Wu (2014) findings, the results indicate that there is still evidence of fee premiums at the audit office when partner level expertise is controlled for, in conditions where the partner is also an industry leader at the national level. As shown in Table 7.5, the coefficients for *NAT#0-CITY#1_PARNAT#6-PARCITY#3* and *NAT#1-CITY#1_PARNAT#6-PARCITY#3* are positively significant at $p<0.01$.

Besides that, another study by Nagy (2014) has found evidence using U.S. data to suggest that auditor specialisation at both the partner and office levels are associated with a fee premium (43 percent) and that there is no significant difference between partner and office level specialisation effects in regards to fee premiums. However, the findings by Nagy (2014) in the U.S. do not apply in the U.K., as there is still evidence of fee premiums for clients of audit firms who are city-industry leaders, despite the engagements not being administered by city-partners who are industry leaders (as shown in Table 7.5, the coefficients for *NAT#1-CITY#1_PARNAT#0-PARCITY#0* and *NAT#1-CITY#1_PARNAT#6-PARCITY#0* are positively significant at $p<0.01$).[18]

[18] Although *NAT#0-CITY#1_PARNAT#6-PARCITY#0* is also positively significant at $p<0.01$, the number of observations (N=1) is too small to warrant a conclusion on this observation *per se*. Thus, the results are interpreted with caution.

In addition, results in Table 7.5 also indicate that there is evidence of fee premiums when the partner is a city-industry leader, but who is not residing in an audit firm which is a city-specific industry leader (as shown in Table 7.5, the coefficients for *NAT#0-CITY#0_PARNAT#6-PARCITY#3* and *NAT#0-CITY#1_PARNAT#6-PARCITY#0* are positively significant at p<0.01). Finally, there is also evidence that a fee premium still exists when the clients are not audited by the Big 4 local office and the city-industry leading partner, as long as they are audited by a national leading audit firm in that industry (*NAT#0-CITY#0_PARNAT#6-PARCITY#0*).[19]

For the corporate governance variables, the results reported in Table 7.5 below are similar from the one reported earlier, using the firm national-city framework and partner national-city framework in Table 7.1 and Table 7.3. *BODFOREIGN* and *ACMEET* remain positive and significant at $p<0.01$. However, *BODFEM, INTAUD, ACSIZE, ACINDP* and *ACFINEXP* are all insignificant at the conventional levels in this analysis, too. Overall, these findings suggest that foreign directorship on the companies' boards and active audit committees contribute to higher audit quality, as demonstrated by the higher level of audit fees paid by these companies, indicating their demand for more extensive and expensive audits.

7.3 Summary

Overall, the results from the multivariate regressions in this chapter are consistent with the proposition of product differentiation theory for industry specialist auditor and reputation theory for corporate governance, which suggests that industry specialist auditors and effective corporate governance are associated with effective monitoring. They complement their monitoring function by contributing to a higher quality audit in terms of a more extensive audit effort, resulting in higher audit fees and a higher perceived audit quality. Audit partner industry leadership at the national level seems to drive the fee premium for auditor industry specialisation in the U.K. above and beyond the audit firm industry leadership. This supports the argument that industry expertise is uniquely attributable to the individual audit partner human capital in terms of their knowledge and experience from leading audit engagements in a particular industry.

[19] There is also evidence of a fee premium when the clients are not audited by the Big 4 local office and the city-industry leading partner, as long as they are audited by a national leading partner in that industry *(NAT#1-CITY#0_PARNAT#6-PARCITY#0*). However, the number of observations (*N*=1) is too small to warrant a conclusion based on this observation *per se*. Thus, the result is interpreted with caution.

Table 7.5: Audit fee regression under a joint firm-partner national-city framework

		Panel A: Exclude corporate governance				Panel B: Include corporate governance			
Variables	**+/-**	**coef.**	**t-stat**	**p-value**	**sig.**	**coef.**	**t-stat**	**p-value**	**sig.**
Intercept		1.394	10.630	0.000	***	1.682	10.570	0.000	***
LNAF	+	0.036	4.750	0.000	***	0.034	4.700	0.000	***
LTA	+	0.410	25.990	0.000	***	0.375	19.330	0.000	***
SQRTSUBS	+	0.057	9.780	0.000	***	0.056	9.830	0.000	***
ROI	-	-0.063	-1.230	0.110		-0.047	-0.910	0.182	
DE	+	-0.096	-1.430	0.077	*	-0.046	-0.720	0.236	
FOREIGN	+	0.113	4.860	0.000	***	0.091	4.110	0.000	***
QUICK	-	-0.011	-3.750	0.000	***	-0.012	-3.800	0.000	***
CATA	+	0.103	2.150	0.016	**	0.138	3.000	0.002	***
OPINION	+	0.043	0.900	0.186		0.019	0.400	0.345	
LONDON	+	0.080	4.400	0.000	***	0.062	3.400	0.001	***
BUSY	+	0.054	3.210	0.001	***	0.039	2.320	0.010	**
LOSS	+	0.030	1.150	0.125		0.024	0.900	0.184	
INITIAL	-	-0.078	-3.140	0.001	***	-0.069	-2.900	0.002	***
INSOWN	-	0.007	0.720	0.236		0.011	1.150	0.126	
Industry Specialist Auditor									
NAT#1-CITY#1_PARNAT#6-PARCITY#3 (n=76)		0.428	10.410	0.000	***	0.438	10.440	0.000	***
NAT#1-CITY#1_PARNAT#0-PARCITY#3 (n=70)		0.024	0.740	0.459		0.020	0.650	0.518	
NAT#1-CITY#0_PARNAT#6-PARCITY#3 (n=2)		0.357	1.690	0.092	*	0.347	1.480	0.139	
NAT#1-CITY#0_PARNAT#0-PARCITY#3 (n=28)		-0.042	-1.000	0.316		-0.039	-0.860	0.389	
NAT#0-CITY#1_PARNAT#6-PARCITY#3 (n=16)		0.255	4.140	0.000	***	0.275	4.700	0.000	***
NAT#0-CITY#1_PARNAT#0-PARCITY#3 (n=77)		0.001	0.040	0.966		0.006	0.180	0.854	
NAT#0-CITY#0_PARNAT#6-PARCITY#3 (n=49)		0.352	9.660	0.000	***	0.347	9.490	0.000	***
NAT#0-CITY#0_PARNAT#0-PARCITY#3 (n=82)		-0.006	-0.210	0.830		0.005	0.180	0.854	
NAT#1-CITY#1_PARNAT#6-PARCITY#0 (n=12)		0.235	4.570	0.000	***	0.209	4.430	0.000	***
NAT#1-CITY#1_PARNAT#0-PARCITY#0 (n=51)		0.084	2.810	0.005	***	0.090	3.050	0.002	***
NAT#1-CITY#0_PARNAT#6-PARCITY#0 (n=1)		0.597	13.750	0.000	***	0.614	12.710	0.000	***
NAT#1-CITY#0_PARNAT#0-PARCITY#0 (n=5)		0.044	0.700	0.483		0.058	0.940	0.346	
NAT#0-CITY#1_PARNAT#6-PARCITY#0 (n=1)		0.193	3.990	0.000	***	0.252	4.800	0.000	***
NAT#0-CITY#1_PARNAT#0-PARCITY#0 (n=10)		-0.049	-0.930	0.351		-0.059	-1.100	0.273	
NAT#0-CITY#0_PARNAT#6-PARCITY#0 (n=50)		0.158	4.330	0.000	***	0.152	4.270	0.000	***
Corporate Governance									
BODFEM						-0.014	-1.220	0.224	
BODFOREIGN						0.066	5.310	0.000	***
INTAUD						0.025	1.080	0.279	

Table 7.5: Audit fee regression under joint firm-partner national-city framework (continued)

		Panel A: Exclude corporate governance				Panel B: Include corporate governance			
Variables	**+/-**	**coef.**	**t-stat**	**p-value**	**sig.**	**coef.**	**t-stat**	**p-value**	**sig.**
ACSIZE						0.005	0.480	0.632	
ACINDP						0.003	0.170	0.863	
ACFINEXP						-0.003	-0.260	0.793	
ACMEET						0.033	3.100	0.002	***
Year fixed-effects		Included				Included			
Industry fixed-effects		Included				Included			
R^2		0.907				0.913			
N		680				680			

*** are significant at p<0.01, ** are significant at p<0.05 and *at p<0.10. All p-values are one-tailed, except for the industry specialist auditor and corporate governance variables which are two-tailed. Industry fixed-effects and year fixed-effects are not reported for brevity, and t-statistics and significance levels are calculated using the White (1980) robust standard errors to correct for heteroscedasticity. Refer Table 5.8 for definition of variables.

Despite the finding that differentiation in fee premiums is mainly affected by the level of industry expertise possessed by the audit partner, and the fact that non-leading partners within these leading firms are still able to charge a fee premium suggest the existence of knowledge sharing and transfer of industry expertise between the partners within the Big 4 audit firms. For the corporate governance variables in particular, the effect of the monitoring role of a foreign directorship and an active audit committee consistently outweighs the other effective characteristics of a board and audit committee across the analyses. There is no consistent evidence that female directorship, presence of internal audit function, and audit committee financial expertise are associated with higher or lower audit fees. Whereas, audit committee size and independence have never been significant in any analysis performed.

The results of all the control variables are significant in the predicted directions and consistent with the prior studies, except for *DE*, *LOSS*, *OPINION* and *INSOWN*, which show inconsistent results or insignificant findings. Various sensitivity and robustness tests are performed in Chapter 8 to determine whether the results obtained from the main analyses discussed in this chapter continue to hold in various settings and across various model specifications.

Table 7.6: Summary of findings from multivariate analysis for the first empirical study

Hypotheses		**Findings**
H1	There is no significant relationship between female directors on boards and audit quality.	Not significant.
H3	There is no significant relationship between foreign directors on boards and audit quality.	Significant positive relationship.
H5	There is no significant relationship between the internal audit function and audit quality.	Not significant.
H7	There is no significant relationship between the size of audit committees and audit quality.	Not significant.
H9	There is no significant relationship between audit committee independence and audit quality.	Not significant.
H11	There is no significant relationship between audit committee financial expertise and audit quality.	Not significant.
H13	There is no relationship between audit committee diligence and audit quality.	Significant positive relationship.
H15	There is no significant relationship between auditor industry leadership and audit quality.	Significant positive relationship.

CHAPTER 8

FURTHER ANALYSIS AND ROBUSTNESS TESTS: THE EFFECT OF INDUSTRY SPECIALIST AUDITORS AND CORPORATE GOVERNANCE ON AUDIT QUALITY

8.1 Introduction

In this chapter, several additional tests are performed to give reasonable assurance that the main findings presented in the last chapter are robust to the various model specifications. The robustness tests include different regression estimator, elimination of incompetitive audit market, alternative measures of auditor industry leadership, the effect of spatial competition, endogeneity, the effect of client size and various different definitions of corporate governance characteristics. All these are discussed in more detail in the following sections of this chapter.

8.2 Alternative regression estimator

This study uses panel data sets, which means typically observations on the same, or a substantially overlapping, set of firms are repeated over time (Gow *et al.*, 2010), where cross sectional and time-series dependence are present as the residuals may be correlated across firms or across time (Petersen, 2009). While the OLS regression estimator with Huber White (1980) robust standard errors are consistent in the presence of heteroscedasticity, it has been argued that its standard errors could be biased or produce mis-specified test statistics (either over or underestimating the true variability of the coefficient estimates) when either form of dependence is present (Gow *et al.*, 2010, p.487). According to Petersen (2009) and Gow *et al.* (2010), the use of OLS or White (1980) robust standard error fails to correct for both cross-sectional and time-series dependence in panel data, thus produces mis-specified test-statistics and invalid inferences about the relationship of the variables examined. In other words, audit quality of the companies could be correlated within a client over time, within a period across clients, or in both ways.

The econometric literature shows that two-way cluster robust standard errors is robust to both time time-series and cross-sectional correlation (Thompson, 2006; Petersen, 2009), while at the same time, robust to heteroscedasticity (Petersen, 2009). Thus, a sensitivity analysis is performed in this section, where all the regressions performed in the last chapter are re-estimated using i) one-way cluster robust standard error, clustering for the firm dimension, and ii) two-way cluster robust standard error, clustering for both the firm and time dimensions.

As shown in the Table 8.1 below, the test results provide qualitatively similar findings as reported in the main regression analysis in the last chapter. Thus, it can be concluded that the main findings are not sensitive to alternative regression estimators.

8.3 Eliminate the effect of monopoly pricing in the market of city-specific industries

The sample screening process imposed earlier in the main analysis of the last chapter has stipulated a minimum of two observations (companies) per unique city-industry combination as to ensure that there is some level of competition in the audit market. This process has reduced the final sample used in the main analysis of the last chapter to N=892. However, a city-specific industry may still be uncompetitive if all the companies in that particular industry in that particular city are audited by the same auditor, as this indicates monopoly pricing by a single auditor. Hence, in order to eliminate such effect from the results, the dataset is reviewed again in order to make sure that all companies within the same city-specific industry are not audited by only one auditor. As a result, the review of the dataset has revealed 18 observations from 15 city-industry combinations that fall within this group. These 18 observations from 15 city-industry combinations are eliminated, which reduces the sample size to 874 observations. The analyses are rerun, and as shown in the Table 8.2 below, the results are qualitatively the same when re-estimated on this reduced sample.

8.4 Continuous market share as a measure of industry leadership

Next, the study tests whether the main results presented in the last chapter are robust to the use of continuous market share measures of auditor industry leadership. Results are presented in the Table 8.3 below. When the audit fee regression is re-estimated using the firm national and city-specific industry variables based on continuous market shares (*Firm national specialist* and *Firm city specialist)* in Model 1, a significant premium is only reported at the national level (coefficient=0.084) at $p<0.05$, whereas the coefficient for *Firm city specialist* is insignificant at $p=0.10$. This shows that national level industry leadership of the audit firm is more important than office-level expertise in explaining fee premiums. On the other hand, when the audit fee regression is estimated using the audit partner national and city-specific variables based on continuous market shares (*Partner national specialist* and *Partner city specialist*) in Model 2, only the *Partner national specialist* is significant at $p<0.01$ (coefficient=1.507), whereas the Partner city specialist is insignificant at $p=0.10$. This indicates that partner industry leadership at the national level is more important that city-specific leadership in explaining fee premiums. Finally, in Model 3, when the firm and partner industry leadership are combined together in one model (*Firm national specialist, Firm city specialist, Partner national specialist and Partner city specialist*) similar to the joint firm-partner industry leadership framework dummies used in the analysis of the last chapter, only the coefficient for firm national specialist is

Table 8.1: Audit fee fegression using different regression estimators

		Panel A: One-way cluster robust standard error									Panel B: Two-way cluster robust standard error								
		Model 1			Model 2			Model 3			Model 1			Model 2			Model 3		
Variables	**+**	**coef.**	**t-stat**	**sig.**	**coef.**	**t-stat**	**sig.**	**coef.**	**t-stat**	**sig.**	**coef.**	**t-stat**	**sig.**	**coef.**	**t-stat**	**sig.**	**coef.**	**t-stat**	**sig.**
Intercept		0.890	4.070	0.000***	1.631	7.210	0.000***	1.682	7.670	0.000***	0.890	4.240	0.000***	1.610	8.330	0.000***	1.662	8.380	0.000***
LNAF	+	0.037	4.270	0.000***	0.033	3.710	0.000***	0.034	3.910	0.000***	0.037	4.340	0.000***	0.033	3.860	0.000***	0.034	4.410	0.000***
LTA	+	0.473	17.030	0.000***	0.384	13.780	0.000***	0.375	13.870	0.000***	0.473	16.720	0.000***	0.384	16.200	0.000***	0.375	14.940	0.000***
SQRTSUBS	+	0.058	7.310	0.000***	0.056	7.310	0.000***	0.056	7.560	0.000***	0.058	5.680	0.000***	0.056	8.510	0.000***	0.056	8.290	0.000***
ROI	-	-0.115	-2.200	0.014**	-0.039	-0.670	0.252	-0.047	-0.810	0.209	-0.115	-2.070	0.020**	-0.039	-0.580	0.281	-0.047	-0.780	0.217
DE	+	-0.084	-0.880	0.190	-0.061	-0.680	0.247	-0.046	-0.520	0.301	-0.084	-1.020	0.155	-0.061	-0.890	0.187	-0.046	-0.670	0.253
FOREIGN	+	0.137	4.060	0.000***	0.092	3.050	0.002***	0.091	3.140	0.001***	0.137	4.020	0.000***	0.092	3.350	0.001***	0.091	3.350	0.001***
QUICK	-	-0.010	-3.310	0.001***	-0.011	-3.110	0.001***	-0.012	-3.460	0.001***	-0.010	-3.130	0.001***	-0.011	-2.470	0.007***	-0.012	-2.690	0.004***
CATA	+	0.162	2.190	0.015**	0.129	1.930	0.027**	0.138	2.100	0.019**	0.162	2.590	0.005***	0.129	2.250	0.013**	0.138	2.390	0.009***
OPINION	+	0.048	0.880	0.190	0.024	0.500	0.309	0.019	0.370	0.358	0.048	1.120	0.132	0.024	0.430	0.333	0.019	0.320	0.373
LONDON	+	0.058	2.030	0.022**	0.066	2.520	0.006***	0.062	2.350	0.010**	0.058	2.330	0.010**	0.066	3.280	0.001***	0.062	2.910	0.002***
BUSY	+	0.065	2.340	0.010**	0.039	1.630	0.053*	0.039	1.660	0.049**	0.065	2.250	0.013**	0.039	2.230	0.013**	0.039	2.240	0.013**
LOSS	+	0.006	0.200	0.422	0.025	0.890	0.187	0.024	0.860	0.195	0.006	0.150	0.439	0.025	0.590	0.277	0.024	0.550	0.290
INITIAL	-	-0.077	-2.930	0.002***	-0.079	-3.250	0.001***	-0.069	-2.820	0.003***	-0.077	-3.290	0.001***	-0.079	-3.090	0.001***	-0.069	-2.760	0.003***
INSOWN	+	-0.003	-0.230	0.408	0.012	0.940	0.174	0.011	0.880	0.191	-0.003	-0.270	0.393	0.012	1.190	0.117	0.011	1.110	0.135
Industry Specialist Auditor																			
Firm national-city framework																			
JOINT_NAT#1-CITY#1 (n=278)		0.068	2.430	0.016**							0.068	2.370	0.018**						
CITY#1 _ONLY (n=132)		-0.002	-0.050	0.961							-0.002	-0.060	0.949						
NAT#1_ONLY (n=44)		0.008	0.170	0.867							0.008	0.260	0.792						
Partner national-city framework																			
PARJOINT_PARNAT#6-PARCITY# (n=143)					0.353	8.720	0.000***							0.353	12.830	0.000***			
PARCITY#3_ONLY (n=257)					-0.011	-0.380	0.707							-0.011	-0.530	0.599			
PARNAT#6_ONLY (n=64)					0.145	3.690	0.000***							0.145	4.500	0.000***			
Joint firm-partner national-city framework																			
NAT#1-CITY#1_PARNAT#6-PARCITY#3 (n=76)								0.438	8.030	0.000***							0.438	0.000**	0.000**
NAT#1-CITY#1_PARNAT#0-PARCITY#3 (n=70)								0.020	0.460	0.646							0.020	0.611	0.611
NAT#1-CITY#0_PARNAT#6-PARCITY#3 (n=2)								0.347	1.520	0.129							0.347	.	.
NAT#1-CITY#0_PARNAT#0-PARCITY#3 (n=28)								-0.039	-0.750	0.456							-0.039	0.363	0.363
NAT#0-CITY#1_PARNAT#6-PARCITY#3 (n=16)								0.275	4.130	0.000***							0.275	0.000**	0.000**
NAT#0-CITY#1_PARNAT#0-PARCITY#3 (n=77)								0.006	0.130	0.893							0.006	0.854	0.854
NAT#0-CITY#0_PARNAT#6-PARCITY#3 (n=49)								0.347	7.320	0.000***							0.347	0.000**	0.000**
NAT#0-CITY#0_PARNAT#0-PARCITY#3 (n=82)								0.005	0.140	0.886							0.005	0.820	0.820
NAT#1-CITY#1_PARNAT#6-PARCITY#0 (n=12)								0.209	3.240	0.001***							0.209	0.000**	0.000**
NAT#1-CITY#1_PARNAT#0-PARCITY#0 (n=51)								0.090	2.300	0.022**							0.090	0.006	0.006**
NAT#1-CITY#0_PARNAT#6-PARCITY#0 (n=1)								0.614	9.600	0.000***							0.614	0.000**	0.000**
NAT#1-CITY#0_PARNAT#0-PARCITY#0 (n=5)								0.058	0.840	0.403							0.058	0.130	0.130
NAT#0-CITY#1_PARNAT#6-PARCITY#0 (n=1)								0.252	3.510	0.001***							0.252	0.000**	0.000**
NAT#0-CITY#1_PARNAT#0-PARCITY#0 (n=10)								-0.059	-1.060	0.288							-0.059	0.003**	0.003**
NAT#0-CITY#0_PARNAT#6-PARCITY#0 (n=50)								0.152	3.430	0.001***							0.152	0.000**	0.000**

Table 8.1: Audit fee regression using different regression estimators (continued)

		Panel A: One-way cluster robust standard error									Panel B: Two-way cluster robust standard error								
		Model 1			Model 2			Model 3			Model 1			Model 2			Model 3		
Variables	**+**	**coef.**	**t-stat**	**sig.**	**coef.**	**t-stat**	**sig.**	**coef.**	**t-stat**	**sig.**	**coef.**	**t-stat**	**sig.**	**coef.**	**t-stat**	**sig.**	**coef.**	**t-stat**	**sig.**
Corporate Governance																			
BODFEM		-0.010	-0.640	0.522	-0.011	-0.670	0.427	-0.014	-0.860	0.391	-0.010	-0.810	0.420	-0.013	-0.930	0.354	-0.014	0.308	0.308
BODFOREIGN		0.081	4.610	0.000	0.081	4.640	0.000***	0.066	4.280	0.000	0.081	5.280	0.000	0.067	6.040	0.000***	0.066	0.000	0.000**
INTAUD		0.035	1.030	0.305	0.037	1.090	0.430	0.025	0.810	0.418	0.035	1.100	0.270	0.024	0.950	0.343	0.025	0.303	0.303
ACSIZE		-0.004	-0.270	0.784	-0.004	-0.240	0.614	0.005	0.380	0.706	-0.004	-0.290	0.774	0.007	0.550	0.580	0.005	0.725	0.725
ACINDP		0.010	0.600	0.549	0.009	0.560	0.830	0.003	0.160	0.876	0.010	0.960	0.340	0.004	0.310	0.760	0.003	0.823	0.823
ACFINEXP		0.014	1.050	0.297	0.013	0.970	0.974	-0.003	-0.220	0.826	0.014	1.250	0.211	0.000	-0.030	0.972	-0.003	0.802	0.802
ACMEET		0.019	1.360	0.176	0.020	1.410	0.024**	0.033	2.620	0.009	0.019	1.270	0.204	0.028	2.410	0.016**	0.033	0.003	0.003**
Year fixed-effects			Included			Included			Included			Included			Included			Included	
Industry fixed-effects			Included			Included			Included			Included			Included			Included	
Cluster by Year			No			No			No			Yes			Yes			Yes	
Cluster by Firm			Yes			Yes			Yes			Yes			Yes			Yes	
R^2			0.881			0.909			0.913			0.881			0.909			0.913	
N			892			680			680			892			680			680	

*** are significant at p<0.01, ** are significant at p<0.05 and *at p<0.10. All p-values are one-tailed, except for the industry specialist auditor variables and corporate governance variables which are two-tailed. Industry fixed-effects and year fixed-effects are not reported for brevity. Refer Table 5.8 for definition of variables.

Table 8.2: Audit fee regression after eliminating incompetitive audit markets

		Firm national-city framework				Partner national-city framework				Joint firm-partner national-city framework			
Variables	**+/-**	**coef.**	**t-stat**	**p-value**	**sig.**	**coef.**	**t-stat**	**p-value**	**sig.**	**coef.**	**t-stat**	**p-value**	**sig.**
Intercept		0.888	6.000	0.000	***	1.638	9.840	0.000	***	1.698	7.590	0.000	***
LNAF	+	0.037	5.590	0.000	***	0.033	4.570	0.000	***	0.034	3.910	0.000	***
LTA	+	0.474	25.300	0.000	***	0.384	19.150	0.000	***	0.374	13.540	0.000	***
SQRTSUBS	+	0.058	10.590	0.000	***	0.056	9.800	0.000	***	0.056	7.470	0.000	***
ROI	-	-0.109	-2.350	0.010	**	-0.031	-0.590	0.278		-0.036	-0.610	0.271	
DE	+	-0.071	-1.180	0.119		-0.048	-0.740	0.229		-0.031	-0.360	0.361	
FOREIGN	+	0.134	6.080	0.000	***	0.088	3.830	0.000	***	0.088	2.990	0.002	***
QUICK	-	-0.010	-3.990	0.000	***	-0.011	-3.310	0.001	***	-0.011	-3.330	0.001	***
CATA	+	0.169	3.700	0.000	**	0.127	2.690	0.004	**	0.132	1.950	0.026	**
OPINION	+	0.054	1.130	0.130		0.028	0.620	0.266		0.021	0.410	0.340	
LONDON	+	0.062	3.650	0.000	**	0.073	4.070	0.000	***	0.070	2.680	0.004	***
BUSY	+	0.064	3.840	0.000	***	0.039	2.270	0.012	*	0.038	1.600	0.055	*
LOSS	+	-0.001	-0.040	0.486		0.022	0.820	0.205		0.020	0.710	0.239	
INITIAL	-	-0.080	-3.340	0.001	***	-0.084	-3.500	0.000	***	-0.073	-2.920	0.002	***
INSOWN	-	-0.003	-0.370	0.357		0.014	1.400	0.082		0.013	0.970	0.166	
Industry Specialist Auditor													
Firm national-city framework													
JOINT_NAT#1- CITY#1		0.068	3.830	0.000	***								
CITY#1_ONLY		0.000	-0.020	0.984									
NAT#1_ONLY		0.008	0.210	0.833									
Partner national-city framework													
PARJOINT_PARNAT#6 -PARCITY#3						0.353	11.250	0.000	***				
PARCITY#3_ONLY						-0.010	-0.470	0.318					
PARNAT#6_ONLY						0.147	4.730	0.000	***				
Joint firm-partner national-city framework													
NAT#1-CITY#1_PARNAT#6-PARCITY#3										0.439	8.070	0.000	***
NAT#1-CITY#1_PARNAT#0-PARCITY#3										0.029	0.660	0.508	
NAT#1-CITY#0_PARNAT#6-PARCITY#3										0.357	1.580	0.116	
NAT#1-CITY#0_PARNAT#0-PARCITY#3										-0.037	-0.710	0.477	**
NAT#0-CITY#1_PARNAT#6-PARCITY#3										0.284	4.220	0.000	***
NAT#0-CITY#1_PARNAT#0-PARCITY#3										0.007	0.170	0.864	
NAT#0-CITY#0_PARNAT#6-PARCITY#3										0.348	7.360	0.000	***
NAT#0-CITY#0_PARNAT#0-PARCITY#3										0.008	0.230	0.820	***
NAT#1-CITY#1_PARNAT#6-PARCITY#0										0.213	3.300	0.001	***
NAT#1-CITY#1_PARNAT#0-PARCITY#0										0.088	2.260	0.025	**
NAT#1-CITY#0_PARNAT#6-PARCITY#0										0.621	9.590	0.000	***
NAT#1-CITY#0_PARNAT#0-PARCITY#0										0.059	0.860	0.390	
NAT#0-CITY#1_PARNAT#6-PARCITY#0										0.265	3.650	0.000	**
NAT#0-CITY#1_PARNAT#0-PARCITY#0										-0.031	-0.530	0.599	
NAT#0-CITY#0_PARNAT#6-PARCITY#0										0.154	3.460	0.001	***

Table 8.2: Audit Fee Regression after eliminating incompetitive audit markets

		Firm national-city framework				Partner national-city framework				Joint firm-partner national-city framework			
Variables	**+/-**	**coef.**	**t-stat**	**p-value**	**sig.**	**coef.**	**t-stat**	**p-value**	**sig.**	**coef.**	**t-stat**	**p-value**	**sig.**
Corporate Governance													
BODFEM		-0.008	-0.700	0.487		-0.011	-0.890	0.186		-0.011	-0.670	0.505	
BODFOREIGN		0.081	6.550	0.000	***	0.066	5.340	0.000	***	0.065	4.190	0.000	***
INTAUD		0.030	1.260	0.207		0.020	0.890	0.188		0.021	0.690	0.493	
ACSIZE		-0.008	-0.700	0.484		0.004	0.360	0.361		0.002	0.130	0.893	
ACINDP		0.009	0.550	0.581		0.002	0.110	0.457		0.000	0.020	0.988	
ACFINEXP		0.015	1.570	0.118		0.002	0.210	0.418		0.000	0.040	0.969	
ACMEET		0.020	1.790	0.074	*	0.030	2.770	0.003	**	0.034	2.670	0.008	**
Year fixed-effects			Included				Included				Included		
Industry fixed-effects			Included				Included				Included		
R^2			0.881				0.909				0.913		
N			874				664				664		

*** are significant at p<0.01, ** are significant at p<0.05 and *at p<0.10. All p-values are one-tailed, except for the industry specialist auditor variables and corporate governance variables which are two-tailed. Industry fixed-effects and year fixed-effects are not reported for brevity, and t-statistics and significance levels are calculated using the White (1980) robust standard errors to correct for heteroscedasticity Refer Table 5.8 for definition of variables.
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Table 8.3: Audit fee regression using continuous market share for industry specialist auditor

		Model 1				Model 2				Model 3			
Variables	**+/-**	**coef.**	**t-stat**	**p-value**	**sig.**	**coef.**	**t-stat**	**p-value**	**sig.**	**coef.**	**t-stat**	**p-value**	**sig.**
Intercept		0.858	5.870	0.000	***	1.759	11.060	0.000	***	1.763	11.140	0.000	***
LNAF	+	0.037	5.610	0.000	***	0.028	4.110	0.000	***	0.029	4.150	0.000	***
LTA	+	0.476	25.710	0.000	***	0.367	19.090	0.000	***	0.365	18.910	0.000	***
SQRTSUBS	+	0.058	10.820	0.000	***	0.060	11.160	0.000	***	0.060	11.180	0.000	***
ROI	-	-0.108	-2.390	0.009	***	-0.023	-0.460	0.322		-0.020	-0.400	0.344	
DE	+	-0.095	-1.580	0.057	*	0.005	0.090	0.466		0.005	0.080	0.467	
FOREIGN	+	0.141	6.490	0.000	***	0.117	5.340	0.000	***	0.117	5.390	0.000	***
QUICK	-	-0.010	-3.850	0.000	***	-0.010	-3.090	0.001	***	-0.010	-3.120	0.001	***
CATA	+	0.157	3.510	0.000	***	0.129	2.910	0.002	***	0.130	2.920	0.002	***
OPINION	+	0.053	1.130	0.129		0.010	0.230	0.410		0.011	0.240	0.407	
LONDON	+	0.059	3.500	0.000	***	0.049	2.880	0.002	***	0.049	2.870	0.002	***
BUSY	+	0.066	3.930	0.000	***	0.039	2.280	0.012	**	0.039	2.280	0.012	**
LOSS	+	0.006	0.230	0.408		0.012	0.470	0.321		0.012	0.480	0.317	
INITIAL	-	-0.077	-3.310	0.001	***	-0.068	-2.820	0.003	***	-0.067	-2.750	0.003	***
INSOWN	+	-0.004	-0.390	0.349		0.018	1.920	0.028	**	0.017	1.830	0.034	**
Industry Specialist Auditor													
Firm national specialist		0.084	2.190	0.029	**					0.000	0.000	0.997	
Firm city		0.028	0.860	0.392						0.026	0.610	0.544	
Partner national specialist						1.507	10.700	0.000	***	1.505	10.700	0.000	***
Partner city specialist						-0.033	-1.020	0.308		-0.052	-1.290	0.197	
Corporate Governance													
BODFEM		-0.012	-1.070	0.287		-0.022	-1.970	0.049	**	-0.022	-1.990	0.047	**
BODFOREIGN		0.082	6.730	0.000	***	0.057	4.790	0.000	***	0.058	4.880	0.000	***
		Model 1				**Model 2**				**Model 3**			
Variables	**+/-**	**coef.**	**t-stat**	**p-value**	**sig.**	**coef.**	**t-stat**	**p-value**	**sig.**	**coef.**	**t-stat**	**p-value**	**sig.**
INTAUD		0.035	1.470	0.141		0.073	3.250	0.001	***	0.074	3.260	0.001	***
ACSIZE		-0.002	-0.200	0.845		0.009	0.860	0.389		0.009	0.870	0.383	
ACINDP		0.014	0.920	0.359		0.012	0.780	0.435		0.013	0.790	0.427	
ACFINEXP		0.013	1.380	0.167		-0.006	-0.580	0.560		-0.006	-0.620	0.535	
ACMEET		0.018	1.680	0.093	*	0.021	1.990	0.047	**	0.021	1.970	0.049	**
Year fixed-effects			Included				Included				Included		
Industry fixed-effects			Included				Included				Included		
R^2			0.881				0.912				0.912		
N			680				680				680		

*** are significant at p<0.01, ** are significant at p<0.05 and *at p<0.10. All p-values are one-tailed, except for the industry specialist auditor variables and corporate governance variables which are two-tailed. Industry fixed-effects and year fixed-effects are not reported for brevity, and t-statistics and significance levels are calculated using the White (1980) robust standard errors to correct for heteroscedasticity. Refer Table 5.8 for definition of variables.

significant (coefficient=1.505, p<0.01). Altogether, these results suggest that partner reputation at the national level matters the most in the U.K. audit market and is a necessary condition for a fee premium above and beyond audit firm industry leadership and partner industry leadership at the city-specific level. These results are also consistent with the findings reported in Table 7.5 on the joint firm-partner national-city framework analysis in the last chapter.

8.5 Alternative definitions of auditor industry leadership at audit firm level

The study further tests whether the main results presented in the last chapter are robust across different definitions of auditor industry leadership found in prior studies; two alternative definitions are adopted and tested in this section: 1) there is at least a 10 percentage points greater market share between the top-ranked and second-ranked industry leader in a national (or, city-specific) audit market, and 2) the cut-off approach introduced by Neal and Riley (2004) in determining national (or, city-specific) industry leadership. The 10 percentage cut-off point for determining national industry leadership is introduced by Mayhew and Wilkins (2003), as to ensure that there is an adequate market dominance or sufficiently larger market share for the top-ranked industry leader relative to the second-ranked industry leader in a particular industry at the national or city-level. Nevertheless, the use of such definition restricts the number of designated industry leaders as there might be circumstances where the auditor have the largest market share at the national (city) level but it is only less than 10 percent lead over its nearest competitor (Reichelt and Wang, 2010; Mayhew and Wilkins, 2003). Based on this definition, this study's dataset reveals that there are on average three industries per year where there are no designated national industry specialist and 10 city-industry combinations where there are no clear city-specific industry leaders when the 10 percent cut-off is imposed. This result lowers the number of companies audited by an industry specialist at the national and city-specific level. There are N=280 companies with auditors that are national industry leaders that can be decomposed into companies audited by national leaders alone (N=60), plus those whose auditors are joint national and city-specific industry leaders (N=220). Similarly, companies with auditors that are city-specific industry leaders (N=362) can be decomposed into those audited by city-specific industry leaders alone (N=142), plus those auditors that are jointly national and city-specific industry leaders (N=220).

Next, following Neal and Riley (2004), the minimum market share for industry leader is defined as 1.2 times the inverse of the number of Big N auditors (1.2 x 1/4) which is 30 percent. In order to apply Neal and Riley's formula to the city-specific level, this study follows the approach used in Reichelt and Wang (2010) which applies the average number of auditors per city-industry combination, rather than the number of Big N auditors. This is because there are fewer auditors in a city-industry combination and non-Big N firms can also be specialists at the city level. On average, the study's dataset reveals that there are 2.5 auditors per city industry market, which computes to 48 percent (1.2 X 1/2.5), or approximately 50 percent. Thus, national (city) industry specialist is designated to the audit firms where the auditor has a market share greater than 30 percent (50 percent) in a particular industry, within a particular year and city. As this approach requires a minimum 30 percent market share for national industry specialists, this allows for multiple national industry firms to be ranked as specialists.

Table 8.4: Audit fee regression using different market shares cut-off for audit firm industry specialisation

		Panel A				Panel B			
Variables	**+/-**	**coef.**	**t-stat**	**p-value**	**sig.**	**coef.**	**t-stat**	**p-value**	**sig.**
Intercept		0.914	6.300	0.000	***	0.870	5.970	0.000	***
LNAF	+	0.037	5.740	0.000	***	0.037	5.640	0.000	***
LTA	+	0.472	25.460	0.000	***	0.477	25.830	0.000	***
SQRTSUBS	+	0.059	11.020	0.000	***	0.058	10.820	0.000	***
ROI	-	-0.109	-2.370	0.009	***	-0.111	-2.430	0.008	***
DE	+	-0.080	-1.350	0.088	*	-0.083	-1.390	0.083	*
FOREIGN	+	0.131	5.980	0.000	***	0.138	6.350	0.000	***
QUICK	-	-0.011	-4.240	0.000	***	-0.010	-4.010	0.000	***
CATA	+	0.169	3.770	0.000	***	0.166	3.690	0.000	***
OPINION	+	0.049	1.050	0.147		0.051	1.100	0.136	
LONDON	+	0.051	3.050	0.001	***	0.055	3.300	0.001	***
BUSY	+	0.066	3.990	0.000	***	0.066	3.940	0.000	***
LOSS	+	0.008	0.310	0.378		0.007	0.270	0.393	
INITIAL	-	-0.077	-3.320	0.001	***	-0.079	-3.420	0.001	***
INSOWN	-	-0.002	-0.250	0.400		-0.003	-0.350	0.364	
Industry Specialist Auditor									
10% market share difference									
JOINT (n=220)		0.075	4.050	0.000	**				
CITY (N=142)		-0.015	-0.640	0.260					
NAT (N=60)		-0.036	-1.260	0.104					
30% market share cut-off									
JOINT (n=280)						0.050	2.760	0.003	***
CITY (N=160)						-0.021	-0.790	0.215	
NAT (N=75)						0.016	0.670	0.253	
Corporate Governance									
BODFEM		-0.010	-0.920	0.180		-0.012	-1.050	0.146	
BODFOREIGN		0.082	6.760	0.000	***	0.081	6.520	0.000	***
INTAUD		0.033	1.410	0.079	*	0.033	1.430	0.077	*
ACSIZE		-0.004	-0.330	0.371		-0.003	-0.240	0.405	
ACINDP		0.008	0.500	0.309		0.012	0.800	0.212	
ACFINEXP		0.013	1.410	0.080	*	0.014	1.440	0.075	*
ACMEET		0.017	1.520	0.064	*	0.018	1.650	0.050	*
Year fixed-effects		Included				Included			
Industry fixed-effects		Included				Included			
R^2		0.882				0.881			
N		680				680			

*** are significant at p<0.01, ** are significant at p<0.05 and *at p<0.10. All p-values are one-tailed, except for the industry specialist auditor variables and corporate governance variables which are two-tailed. Industry fixed-effects and year fixed-effects are not reported for brevity, and t-statistics and significance levels are calculated using the White (1980) robust standard errors to correct for heteroscedasticity. Refer Table 5.8 for definition of variables.

On the other hand, it reduces the number of city-specialist only for those with market share exceeding 50 percent, and this is often the case that there is an absence of industry specialists in larger cities such as London, Birmingham, Manchester and Leeds as there are normally more Big 4 firms competing in those markets. For the four year period from 2008 to 2011 in this study, on average, there are five industries with two national industry specialists (16 percent) and on average, 12 city-industry combinations where there is no single city-specialist which exceeds the 50 percent cut-off market share. Thus, under this definition, there are more companies audited by national industry leaders (N=440), that can be decomposed into those audited by national leaders alone (N=75), plus those whose auditors are joint national and city-specific industry leaders (N=280). However, there is a decrease in the number of companies with auditors that are city-specific industry leaders (N=355) that can be decomposed into those audited by city-specific industry leaders alone (N=160), plus those auditors that are jointly national and city-specific industry leaders (N=280).

Results for the 10 percent market share cut-off measure following Mayhew and Wilkins (2003) is presented in Panel A of the Table 8.4, whereas results for the cut-off measures following Neal and Riley (2004) are presented in the Panel B. Both results in Panel A and Panel B are comparable, and qualitatively the same from the ones reported in our main analysis in Panel B of Table 7.1 in the last chapter, suggesting the findings for the audit firm industry specialisation is robust to alternative market share cut-offs for determining an industry specialist.

8.6 Effect of spatial competition on fee premium of the audit firms industry specialists

Using the spatial competition theory, Numan and Willekens (2012) argue the market distance between the industry specialist audit firm and its closest competitor within a city-industry audit market affects the ability of the auditor to charge a fee premium. This assertion is based on the argument that the smaller (larger) is the market share distance between the industry specialist audit firm and its closest competitor within the city-industry audit market, then the higher (lower) would be the pressure on the audit fees, as higher degree of differentiation gives an auditor market power over its clients. Their study using the U.S. audit market has reported that market share-based measures of industry specialisation pick up both auditor–client alignment effects (market power through specialised knowledge) as well as market share distance effects (market power through differentiation from the closest competitor).

Following Numan and Willekens (2012), this study tests for the spatial competition effect on the fee premium earned by the industry specialist auditor. Since the results of the Model 3 in Table 7.1 indicates that only the audit firm which is a joint national and city industry leader is able to command a fee premium, but not the city industry leader alone or the national industry leader alone, then *JOINT_NAT#1-CITY#1* will be the variable of interest, which is the experimental variable in this analysis, while *CITY#1_ONLY* and *NAT#1_ONLY* will be listed alongside as control variables. The *JOINT_NAT#1-CITY#1* represents the auditor alignment with the client's industry in the application of the spatial competition theory. This is because when the auditor invests a huge amount of resources in a particular industry, and hence acquires a large market share and leadership position in that particular industry, it is actually pursuing a differentiation strategy in order to meet client's demand for higher audit quality by offering its industry expertise. Thus, positive relationship is expected between *JOINT_NAT#1-CITY#1* and audit fees.

Further, another experimental variable *DISTANCE_COMP* is also included in the model to measure the extent to which the industry specialist audit firm (*JOINT_NAT#1-CITY#1)* is differentiated or distanced from its closest competitor, based on the city-industry market share. The *DISTANCE_COMP* variable could also be interpreted as the differentiation gap between the incumbent auditor and its closest competitor. While this gap is, on average, larger for leaders, it is not equal for all leaders. Hence some leaders will be more differentiated than others and this may be associated with higher fee premiums. Since a higher degree of differentiation or distance compared to the closest competitor gives an auditor higher market power, the current study expects a positive effect of *DISTANCE_COMP* on fees beyond the leader (*JOINT_NAT#1-CITY#1*) effect.

Following Degryse and Ongena (2005) and Numan and Willekens (2012), the Herfindahl concentration index per audit market (*HERFINDEX*) is introduced as an additional control variable in the model, to control for potential market power effects due to supplier concentration. The *HERFINDEX* captures alternative explanations for competition between audit offices. Prior studies report significant effects of the Herfindahl index on audit fees (for example, Pearson and Trompeter, 1994; Numan and Willekens, 2012). In the empirical analysis, *DISTANCE_COMP* and *HERFINDEX* are specified at the city-industry level, based on the assumption that clients consider geographically proximate audit offices as potential auditor candidates and local audit offices compete to attract clients, which is consistent with the spatial competition theory. In addition, this choice is motivated by recent literature that shows that industry specialisation is audit-office specific (i.e., Francis *et al*., 2005; Basioudis and Francis, 2007).

In order to test for the effect of the spatial competition on the fee premium charged by the audit firms industry specialists in the U.K., a further 122 observations from the full sample under the firm national-city framework (N=892) has been dropped to exclude monopolistic markets where the *DISTANCE_COMP* or the *HERFINDEX* equals to 1. The final sample is 770 companies in this analysis.

The results of the analyses are presented in Table 8.5 below. Three regression models are reported in the Table 8.5 below. Model 1 is testing only for the effect of auditor–client alignment (*JOINT_NAT#1-CITY#1*); Model 2 is testing for the effects of both auditor–client alignment (*JOINT_NAT#1-CITY#1*) and the distance of specialist to the closest competitor (*DISTANCE_COMP)*; and finally, Model 3 is testing the interaction between the distance of specialist to the closest competitor and the auditor–client alignment (*DISTANCE_COMP* x *JOINT_NAT#1-CITY#1*), thus taking into account the interdependence of these measures.

All regression models in Table 8.5 are significant (p<0. 01), with an R^2 of around 88 percent. Consistent with prior audit fee literature, in Model 1, the coefficient for *JOINT_NAT#1-CITY#1* is positive (coefficient=0.090) and significant at p<0.01, suggesting that the auditor–client alignment positively affects the audit fees that auditors can charge. When *DISTANCE_COMP* enters the analysis in Model 2, the coefficient of *JOINT_NAT#1-CITY#1*, although significant (p<0.10), dropped to 0.059, while the coefficient for the *DISTANCE_COMP* is 0.148 and significant at p<0.01.

These results indicate that an industry specialist auditor in the U.K. in the period 2008-2011 derives the fee premium not only from developing specialised knowledge about a client's industry per se, but also from differentiating or distancing itself from its closest competitor. Given that the coefficient for the *DISTANCE_COMP* is 0.089 larger than coefficient for the *JOINT_NAT#1-CITY#1* (the difference between the coefficients of the two variables separately is 0.148 and 0.059 resepctively, as shown in Model 2 of the table below), this finding also indicate that the distance in the city-industry market share between the audit firm industry specialist with its closest competitor (*DISTANCE_COMP*) has a positive effect on audit fees beyond the audit firm industry leadership at both the national and city level (*JOINT_NAT#1-CITY#1*).

Turning to Model 3 in Table 8.5 below, the results show that the interaction term *DISTANCE_COMP* x *JOINT_NAT#1-CITY#1* is not significant at any conventional level, whereas the main effects of *JOINT_NAT#1-CITY#1* and *DISTANCE_COMP* are individually significant (coefficient =0.058, p<0.10 and coefficient =0.150, p<0.10, respectively) and in the predicted direction. The finding in Model 3 suggests that there is no interdependency between auditor-client alignment and distance to the closest competitor in influencing the level of audit fees. Nevertheless, given that both variables, *JOINT _NAT#1-CITY#1* and *DISTANCE_COMP* are positive and significant, it can be concluded that the audit firm's position as a joint national and city industry leader in the U.K. already gives it a sufficient market power to extract a fee premium, without being pressurised by the distance of its closest competitor. This is because there is a distinct fee premium attached either to the audit firm joint national and city industry leader or to its distance with the closest competitor. This U.K. finding therefore indicates that the fee premium earned by the firm joint national and city industry leadership reported in Chapter 7 earlier is not merely due to successful differentiation strategy, but also partly driven by the fee pressure from its closest competitor in the city-industry audit market. Similar finding was reported by Marleen and Willekens (2012) using U.S. data during the period 2005 to 2006. Except in Model 1, the *HERFINDEX* is negatively associated to audit fees (p<0.01), which may suggest that audit fees are lower in more concentrated market segments as competition is more intense. This is consistent with the theoretical arguments put forward by Stiglitz (1987) using a customer search model demonstrating that concentrated markets can be more competitive than atomistic markets, as it may be less costly for customers to search for all available prices when there are few suppliers.

Table 8.5: Audit fee regression on the effect of competitive pressure on fee premium of industry specialist under the firm national-city framework

		Model 1				Model 2				Model 3			
Variables	**+/-**	**coef.**	**t-stat**	**p-value**	**sig.**	**coef.**	**t-stat**	**p-value**	**sig.**	**coef.**	**t-stat**	**p-value**	**sig.**
Intercept		0.981	6.460	0.004	***	1.082	5.780	0.005	***	1.082	5.790	0.005	***
HERFINDEX		-0.054	-1.510	0.228		-0.219	-8.830	0.003	***	-0.217	-9.680	0.001	***
LNAF	+	0.037	5.440	0.006	***	0.037	5.490	0.006	***	0.037	5.490	0.006	***
LTA	+	0.467	22.730	0.000	***	0.464	22.310	0.000	***	0.464	22.270	0.000	***
SQRTSUBS	+	0.055	10.320	0.001	***	0.054	9.850	0.001	***	0.054	9.790	0.001	***
ROI	-	-0.111	-8.100	0.002	***	-0.106	-5.160	0.007	***	-0.106	-5.110	0.007	***
DE	+	-0.078	-0.710	0.264		-0.096	-0.920	0.212		-0.097	-0.930	0.211	
FOREIGN	+	0.138	5.420	0.006	***	0.136	5.340	0.007	***	0.136	5.330	0.007	***
QUICK	-	-0.009	-2.760	0.035	**	-0.009	-2.730	0.036	**	-0.009	-2.750	0.036	**
CATA	+	0.194	3.420	0.021	**	0.189	3.110	0.027	**	0.189	3.080	0.027	**
OPINION	+	0.007	0.140	0.449		-0.002	-0.040	0.487		-0.001	-0.030	0.490	
LONDON	+	0.056	1.980	0.072	*	0.056	2.060	0.066	*	0.056	2.060	0.066	*
BUSY	+	0.064	1.890	0.078	*	0.066	2.000	0.070	*	0.066	1.980	0.071	*
LOSS	+	0.012	0.330	0.381		0.009	0.270	0.404		0.010	0.270	0.403	
INITIAL	-	-0.071	-2.480	0.045	**	-0.070	-2.310	0.052	*	-0.070	-2.250	0.055	*
INSOWN	-	-0.012	-1.180	0.162		-0.012	-1.160	0.164		-0.012	-1.160	0.164	
CITY#1_ONLY		0.000	0.000	1.000		-0.022	-0.530	0.631		-0.023	-0.540	0.315	
NAT#1_ONLY		0.008	0.290	0.788		-0.004	-0.120	0.913		0.002	0.050	0.481	
<u>Experimental variables:</u>													
JOINT _NAT#1-CITY#1	+	0.090	6.110	0.009	***	0.059	2.660	0.077	*	0.058	2.700	0.074	*
DISTANCE_COMP	+					0.148	2.440	0.092	*	0.150	2.470	0.090	*
DISTANCE x JOINT _NAT#1-CITY#1	+									-0.029	-0.430	0.698	
<u>*Corporate Governance*</u>													
BODFEM		-0.014	-2.250	0.110		-0.013	-2.230	0.112		-0.013	-2.290	0.106	
BODFOREIGN		0.085	6.270	0.008	***	0.087	5.540	0.012	**	0.087	5.550	0.012	**
INTAUD		0.045	1.600	0.208		0.041	1.660	0.195		0.041	1.670	0.193	
ACSIZE		-0.010	-0.430	0.697		-0.008	-0.370	0.738		-0.008	-0.360	0.740	
ACINDP		0.011	0.320	0.767		0.011	0.340	0.756		0.011	0.340	0.754	
ACFINEXP		0.022	3.530	0.039	*	0.021	3.450	0.041	*	0.021	3.450	0.041	**
ACMEET		0.019	1.460	0.241		0.019	1.340	0.274		0.019	1.320	0.279	
Year fixed-effects			Included				Included				Included		
Industry fixed-effects			Included				Included				Included		
R^2			0.880				0.881				0.881		
N			770				770				770		

*** are significant at p<0.01, ** are significant at p<0.05 and *at p<0.10. All p-values are one-tailed, except for the industry specialist auditor variables, the experimental variables and the corporate governance variables which are two-tailed. Industry fixed-effects and year fixed-effects are not reported for brevity, and standard errors are adjusted for heteroskedasticity and possible correlation within an audit firm cluster, following the methodology of Rogers (1993). Refer Table 5.8 for definition of variables.

Taken together, the results in Table 8.5 above indicate that local audit offices do compete on audit fees but that they can soften this competition, and hence earn a fee premium, by specialising in certain industries, particularly industries that are distant from the industry expertise of competitors. Competition in the audit market is thus in line with spatial competition in a Hotelling-type model. Although prior studies document that, ceteris paribus, industry specialist auditors are able to charge higher audit fees, it seems that market share-based measures of industry specialisation pick up both auditor–client alignment effects (market power through specialised knowledge) as well as market share distance effects (market power through differentiation from the closest competitor).

8.7 Endogeneity and two-stage least squares (2SLS) regression

Prior literature suggests that there is a significant relationship between auditing services and non-audit services when both are jointly provided by the same auditor (Simunic, 1984; Palmrose, 1986). There are two sets of arguments here that non-audit fees may affect audit fees or vice versa. The first argument relates to knowledge spillovers from the joint provision of audits and non-audit services could lead to economic rents by the auditors (Simunic, 1984). This suggests that it should be expected that there would be a positive relationship between audit and non-audit services fees.

The second argument is that there is a possibility that auditing services may be used as a "*loss-leader*" in order to gain a higher profit margin on non-audit services fees (Hillson and Kennelley, 1988: 33). In other words, the auditor discounts auditing services in order to hold on to the lucrative fees of non-audit services, which in turn suggests that there will be a negative relationship between audit and non-audit services fees. Evidence from prior literature also suggests that board of director and audit committee characteristics may influence an auditors' risk assessment and audit planning, which in turn affects the audit pricing (Tsui *et al*., 2001; Boo and Sharma, 2008; Krishnan and Visvanathan, 2009).

To address these issues, the present study first identifies whether the non-audit fees or board of director and audit committee characteristics may suffer from the endogeneity problem by performing the Durbin-Wu-Hausman test on each of these variables. For the non-audit fees, following Whisenant *et al*., (2003), the instrumental variable (IV) for non-audit fees is an indicator variable which is equal to 1 if the company experienced new financing; whereas for corporate governance variables, following Larcker and Rusticus (2010) the instrumental variables (IV) are the lagged values of the endogenous variables. The IV must fulfil the following conditions: (1) it should be outside the regression model, (2) it should be uncorrelated with the regression errors, and (3) it should be strongly correlated with the endogenous variables. To ensure the IV is valid, the present study has estimated the reduced form equation on the first stage of 2SLS regression and examined the significance level of the endogenous variables. The *t*-statistic should be at least 3.3 (Adkins and Hill, 2007: 249-250). All the IVs meet the suggested criterions. Identifying appropriate instruments is difficult in conducting a two-stage least

Table 8.6: Endogeneity test for *LAF* model

Durbin-Wu-Hausman test

H0 = the residual of *LNNAF, BODFEM, BODFOREIGN, INTAUD, ACSIZE,ACINDP, ACFINEXP and ACMEET are exogenous* Reject H0 if F-statistic significant	
Variable	Chi2 (1)
LNAF	0.276 (p = 0.5990)
BODFEM	0.030 (p = 0.8619)
BODFOREIGN	2.823 (p = 0.0929)
INTAUD	2.122 (p = 0.1451)
ACSIZE	0.068 (p = 0.7935)
ACINDP	0.121 (p = 0.7273)
ACFINEXP	3.201 (p = 0.0736)
ACMEET	0.902 (p = 0.3421)

Refer Table 5.8 for definition of variables.

Table 8.7: 2SLS Audit fee regression for endogenous variables

		BODFOREIGN				ACFINEXP			
Variables	**+/-**	**coef.**	**t-stat**	**p-value**	**sig.**	**coef.**	**t-stat**	**p-value**	**sig.**
Intercept		0.836	5.420	0.000	***	0.814	5.340	0.000	***
LNAF	+	0.034	4.810	0.000	***	0.035	4.880	0.000	***
LTA	+	0.468	23.940	0.000	***	0.471	24.280	0.000	***
SQRTSUBS	+	0.064	11.080	0.000	***	0.063	10.780	0.000	***
ROI	-	-0.128	-2.050	0.021	**	-0.117	-1.860	0.032	**
DE	+	-0.057	-0.780	0.219		-0.075	-1.030	0.151	
FOREIGN	+	0.158	6.430	0.000	***	0.167	6.820	0.000	***
QUICK	-	-0.011	-3.500	0.000	***	-0.010	-3.430	0.001	***
CATA	+	0.171	3.410	0.001	***	0.169	3.370	0.001	***
OPINION	+	-0.008	-0.180	0.428		0.001	0.010	0.496	
LONDON	+	0.057	2.910	0.002	***	0.065	3.360	0.001	***
BUSY	+	0.056	2.880	0.002	***	0.060	3.110	0.001	***
LOSS	+	-0.001	-0.020	0.491		0.002	0.080	0.469	
INITIAL	-	-0.069	-2.310	0.011	**	-0.077	-2.570	0.005	***
INSOWN	-	0.001	0.050	0.480		-0.004	-0.350	0.362	
Industry Specialist Auditor									
JOINT_NAT#1-CITY#1		0.067	3.150	0.002	***	0.065	3.030	0.002	***
CITY#1_ONLY		0.016	0.580	0.561		0.012	0.440	0.663	
NAT#1_ONLY		0.033	0.800	0.425		0.030	0.720	0.472	
Corporate Governance									
BODFEM		-0.015	-1.260	0.209		-0.012	-1.000	0.315	
BODFOREIGN		0.112	5.800	0.000	**	0.090	6.580	0.000	***
INTAUD		0.026	0.980	0.329		0.017	0.630	0.530	
ACSIZE		-0.003	-0.230	0.814		0.000	-0.030	0.976	
ACINDP		0.026	1.390	0.165		0.024	1.240	0.215	
ACFINEXP		0.012	1.160	0.245		0.034	1.990	0.047	**
ACMEET		0.007	0.590	0.556		0.005	0.430	0.670	
Year fixed-effects			Included				Included		
Industry fixed-effects			Included				Included		
R^2			0.888				0.887		
N			607				607		

*** are significant at p<0.01, ** are significant at p<0.05 and *at p<0.10. All p-values are one-tailed, except for the industry specialist auditor variables and corporate governance variables which are two-tailed. Industry fixed-effects and year fixed-effects are not reported for brevity, and t-statistics and significance levels are calculated using the White (1980) robust standard errors to correct for heteroscedasticity. Refer Table 5.8 for definition of variables.

squares analysis and finding incorrect instruments can lead to IV estimates that are more biased than simple OLS estimates[20]. The Durbin-Wu-Hausman tests the null hypothesis that the residual values of *LNAF*, *BODFEM*, *BODFOREIGN*, *INTAUD*, *ACSIZE*, *ACINDP*, *ACMEET* and *ACFINEXP* are jointly equal to zero. If the *F*-statistic is significant, then the null hypothesis would be rejected, suggesting that endogeneity is present.

Table 8.6 above presents the results of the Durbin-Wu-Hausman test. All of the variables suggest insignificant *F*-statistics except for *BODFOREIGN* and *ACFINEXP*, which confirms the presence of endogeneity since the *F*-statistics are significant. To mitigate the bias caused by endogeneity, the 2SLS regression is performed on *BODFOREIGN* and *ACFINEXP* respectively. The results are presented in Table 8.7 above. Compared to the main findings, the results of 2SLS regressions for *BODFOREIGN* seem consistent, except for the *ACCFINEXP*, which is found to be positively related to *LAF* in the 2SLS models, suggesting that the audit committee with more accounting or financially expert members contributes to more extensive and expensive audits. The other variables remained unchanged. In summary, the main finding on *BODFOREIGN* is that it continues to have positive relationship with *LAF*, suggesting that the inference made regarding *BODFOREIGN* in the main finding is robust to the presence of endogeneity.

8.8 Audit partner gender and tenure

Motivated by Ittonen and Vahamaa (2012) finding that female audit engagement partners charge higher audit fees, additional analysis is performed in this section by including an indicator variable for female audit partners (*PART_FEM*), and it is expected that its coefficient would be positive. Besides that, Gul *et al*. (2013) and Bedard and Johnstone (2010) also argue that partners are likely to build up their reputation and expertise with tenure. Thus, we also include a partner tenure (*PART_TEN*) continuous variable in the regression, which takes the value between 1 and 3, and it is expected that its coefficient would be positive. As the study's sample only has partner data available back to fiscal year 2011, and the earliest sample year is 2008, this means the maximum tenure of a partner in the sample is 3 years only. Therefore, the range of partner tenure variable would fall within 1 to 3 years, so that tenure is measured on an equal basis over the sample period.

Model 1 in Table 8.8 below presents the moderating effect of gender of the audit partner industry specialist on audit fees. Interestingly, when the gender of the audit partner (*PART_FEM*) is controlled for in the model, the adjusted R^2 of the regression model increased by 1 percent (from 0.909 to 0.919), while the coefficients for *PARJOINT_PARNAT#6-CITY#3* and *PARNAT#6_ONLY* remain significant at $p<0.01$, as reported in the main analysis of the last chapter. This suggest that *PART_FEM* is an

[20] Larcker *et al*. (2008) provide an excellent discussion of the potential problems and limitations associated with using an instrumental variables approach.

Table 8.8: Audit fee regression on the effect of audit partner gender and tenure on audit fees under the partner national-city framework

		Model 1				Model 2			
Variables	**+/-**	**coef.**	**t-stat**	**p-value**	**sig.**	**Coef.**	**t-stat**	**p-value**	**sig.**
Intercept		1.634	10.090	0.000	***	1.635	10.070	0.000	***
LNAF	+	0.032	4.490	0.000	***	0.033	4.650	0.000	***
LTA	+	0.383	19.700	0.000	***	0.385	19.730	0.000	***
SQRTSUBS	+	0.057	9.960	0.000	***	0.056	9.940	0.000	***
ROI	-	-0.040	-0.780	0.217	***	-0.035	-0.680	0.249	***
DE	+	-0.060	-0.940	0.174		-0.065	-1.020	0.155	
FOREIGN	+	0.090	4.000	0.000	***	0.091	4.030	0.000	***
QUICK	-	-0.011	-3.500	0.001	***	-0.011	-3.440	0.001	***
CATA	+	0.130	2.830	0.003	***	0.129	2.800	0.003	***
OPINION	+	0.021	0.490	0.311		0.026	0.570	0.284	
LONDON	+	0.068	3.830	0.000	***	0.067	3.750	0.000	***
BUSY	+	0.041	2.440	0.008	***	0.040	2.350	0.010	**
LOSS	+	0.026	1.000	0.159		0.026	1.000	0.158	
INITIAL	-	-0.080	-3.430	0.001	***	-0.081	-3.510	0.000	***
INSOWN	-	0.011	1.150	0.126		0.012	1.270	0.103	
PART_FEM		0.082	2.530	0.012	**				
PART_TEN						-0.010	-0.680	0.495	
Industry Specialist Auditor									
JOINTPART_PARNAT#6-PARCITY#3		0.353	11.340	0.000	**	0.353	11.280	0.000	***
PATCITY#3_ONLY		-0.008	-0.380	0.703		-0.011	-0.540	0.590	
PATNAT#6_ONLY		0.149	4.770	0.000	***	0.145	4.690	0.000	***
Corporate Governance									
BODFEM		-0.014	-1.210	0.228		-0.013	-1.120	0.262	
BODFOREIGN		0.067	5.420	0.000	***	0.066	5.320	0.000	***
INTAUD		0.023	1.050	0.296		0.023	1.040	0.300	
ACSIZE		0.009	0.820	0.412		0.007	0.650	0.517	
ACINDP		0.002	0.110	0.912		0.004	0.240	0.809	
ACFINEXP		0.002	0.150	0.883		-0.001	-0.060	0.956	
ACMEET		0.029	2.720	0.007	***	0.028	2.670	0.008	***
Year fixed-effects		Included				Included			
Industry fixed-effects		Included				Included			
R^2		0.919				0.910			
N		680				680			

*** are significant at p<0.01, ** are significant at p<0.05 and *at p<0.10. All p-values are one-tailed, except for the industry specialist auditor variables and corporate governance variables which are two-tailed. Industry fixed-effects and year fixed-effects are not reported for brevity, and t-statistics and significance levels are calculated using the White (1980) robust standard errors to correct for heteroscedasticity. Refer Table 5.8 for definition of variables.

important omitted variable in the main analysis on partner national-city framework for auditor industry specialisation, as it moderates the relationship between partner industry specialist and audit fees. The *PART_FEM* coefficient is 0.082 and is significant at $p<0.05$.

Model 2 in Table 8.8 above presents the moderating effect of tenure of the audit partner industry specialist (*PART_TEN*) on audit fees. When the *PART_TEN* is controlled for in the model, the adjusted R^2 of the regression model increased by 0.1 percent (from 0.909 to 0.910), while the coefficients for *PARJOINT_PARNAT#6-CITY#3* and *PARNAT#6_ONLY* remain significant at $p<0.01$, as reported in the main analysis of the last chapter too. The *PART_TEN* coefficient is not significant at any conventional levels. This is probably because the partner tenure period measurement is too short as data on audit partner is only available since 2009, and the earliest sample year for the dataset is 2011. Therefore, the maximum value for the *PART_TEN* variable is capped at 3 years, so that the tenure is measured on an equal basis over the sample period. Future research could try to examine partner tenure in the U.K. over a longer duration of years, other studies on audit partner tenure in the US have reported significant effects (Gul *et al*., 2013, Bedard and Johnstone, 2010). In comparison to prior studies, Goodwin and Wu (2014) found that the fee premium for partner industry specialist in their study is not moderated by the gender and tenure of the audit partner, as they failed to find any significant result.

8.9 The effect of client size

To examine the Big 4 industry leadership premium based on the auditee size, we follow Francis *et al*. (2005) by splitting the full sample into two sub-samples; large client segment and small client segment. The audit firm sample (N=892) is split into large clients segment and small clients segment (N=446 each) based on its median value of total assets (GBP £367.423 million). Whereas the partner sample (N=680) is split into large clients segment and small clients segment (N=340 each) based on its median value of total assets (GBP £372.123 million).

As shown in Panel A of the Table 8.9 below, under the firm national-city framework and in the large client segment, the premium for firm industry leadership is significant for the joint national and city-specific industry leaders (coefficient=0.090, $p<0.01$) but not for the city-specific industry leaders alone or for the national leaders alone ($p>0.10$). This indicates that the fee premium for industry leadership in the large client segment is driven by the audit firm joint industry leadership at the national and city level. This finding in the large client segment is consistent with the one reported in the main analysis in Table 7.1 earlier. Interestingly, for the small client segment, as shown in Panel B, neither of the leaders results in a fee premium. This indicates that the results of the main analysis are actually driven by large clients. This finding is consistent with evidence from New Zealand, Australia and U.S.. Hay and Jeter (2011) have documented that the fee premium for industry leadership in the New Zealand is driven by the city-industry leadership in the large client segment, whereas Craswell *et al*. (1995) and

Francis *et al*. (2005) have reported significant fee premiums for national industry leaders in the large clients segment only.

Under the partner national-city framework, the empirical results for the large clients segment in Table 8.9 Panel A below show that the fee premium for the joint leaders and the national partner leaders alone are significant (coefficient=0.386, $p<0.01$ and coefficient=0.174, $p<0.01$ respectively), but not for the city-specific partner leader alone. An *F*-test indicates that there is no significant difference between the fee premium charged by the joint national-city leading partners and the national leading partners alone (*F*-statistic=47.56, *p*-value=0.000) in the large client segment. Whereas for the small client segment, as shown in Panel B, the coefficient for the partner national leadership is larger than the joint coefficient (coefficient=0.208, $p<0.05$ and coefficient=0.171, $p<0.05$ respectively), suggesting that in the small client segment, the partners national industry leadership matter the most. An *F*-test indicates that there is no significant difference between the fee premium charged by the joint national-city leading partners and the national leading partners alone (*F*-statistic=3.18, *p*-value=0.043) in the small clients segment. Taken together, the findings for the partner industry leadership in both the large and small clients segments under the partner national-city framework suggest that partner national industry leadership drives audit pricing in the U.K.

Under the joint firm partner framework of Table 8.9 Panel A, for the large client sample, it can be seen that significant fee premiums are only reported when the partner is a national industry leader despite the firm and the city partner non-leadership. This suggests that partner leadership at the national level drives fee premium in the large client sample. The only exception is when the national partner is not an industry leader, the firm needs to be a joint leader at the national and city level as well as the partner need to be a leader at the city level in order to gain a fee premium (*NAT#1-CITY#1_PARNAT#6-PARCITY#3*). Whereas for the small client sample as presented in Panel B, the results are mixed. A fee premium could either be earned when the partner is both a leader at the national and the city level in the absence of firm industry leadership (*NAT#0-CITY#0_PARNAT#6-PARCITY#3*), when the audit firm is both a leader at the national and city level in the absence of partner industry leadership (*NAT#1-CITY#1_PARNAT#0-PARCITY#0*), and also when the partner alone is the industry leader nationally (*NAT#0-CITY#0_PARNAT#6-PARCITY#0*). Overall, the empirical results from the firm and partner level analyses suggest that the fee premium for industry leadership in the U.K. is driven by the partner leadership at the national level in both the large and small client segments.

Table 8.9: Audit fee regression for sub-samples based on client size

Panel A: Large clients													
		Firm national-city framework				**Partner national-city framework**				**Joint firm-partner national-city framework**			
Variables	**+/-**	**coef.**	**t-stat**	**p-value**	**sig.**	**coef.**	**t-stat**	**p-value**	**sig.**	**coef.**	**t-stat**	**p-value**	**sig.**
Intercept		0.380	1.280	0.100		1.452	4.380	0.000	***	1.617	4.590	0.000	***
LNAF	+	0.055	4.780	0.000	***	0.048	3.770	0.000	***	0.044	3.480	0.001	***
LTA	+	0.500	16.290	0.000	***	0.387	11.330	0.000	***	0.368	10.040	0.000	***
SQRTSUBS	+	0.057	8.090	0.000	***	0.053	7.340	0.000	***	0.051	7.100	0.000	***
ROI	-	0.038	0.270	0.394		0.067	0.410	0.341		0.057	0.360	0.362	
DE	+	-0.162	-1.700	0.046	**	-0.157	-1.540	0.062	*	-0.133	-1.240	0.109	
FOREIGN	+	0.211	6.370	0.000	***	0.110	3.100	0.001	***	0.109	3.140	0.001	***
QUICK	-	-0.012	-1.780	0.038	**	-0.015	-2.410	0.009	***	-0.014	-2.130	0.017	**
CATA	+	0.161	1.930	0.027	**	0.051	0.670	0.253		0.087	1.030	0.151	
OPINION	+	0.172	2.370	0.009	***	0.223	3.320	0.001	***	0.208	2.890	0.002	***
LONDON	+	0.082	3.590	0.000	***	0.100	4.090	0.000	***	0.099	3.860	0.000	***
BUSY	+	0.087	2.930	0.002	***	0.055	1.800	0.037	**	0.044	1.480	0.070	*
LOSS	+	-0.013	-0.310	0.380		-0.003	-0.090	0.465		-0.005	-0.130	0.449	
INITIAL	-	-0.054	-1.330	0.093		-0.071	-1.910	0.029	**	-0.054	-1.500	0.068	*
INSOWN		0.010	0.600	0.276		0.026	1.560	0.060	*	0.028	1.520	0.065	*
Industry specialist auditor													
Firm national-city framework													
JOINT_NAT#1-CITY#1		0.090	3.520	0.000	***								
CITY#1_ONLY		-0.007	-0.150	0.881									
NAT#1_ONLY		0.115	1.050	0.292									
Partner national-city framework													
JOINT_PARNAT#6-PARCITY#3						0.386	9.690	0.000	***				
PARCITY#3_ONLY						0.044	1.120	0.264					
PARNAT#6_ONLY						0.174	4.840	0.000	***				
Joint firm-partner national-city framework													
NAT#1-CITY#1_PARNAT#6-PARCITY#3										0.465	9.270	0.000	***
NAT#1-CITY#1_PARNAT#0-PARCITY#3										0.142	2.780	0.006	***
NAT#1-CITY#0_PARNAT#6-PARCITY#3										0.521	2.570	0.011	**
NAT#1-CITY#0_PARNAT#0-PARCITY#3										-0.023	-0.210	0.832	
NAT#0-CITY#1_PARNAT#6-PARCITY#3										0.410	5.540	0.000	***
NAT#0-CITY#1_PARNAT#0-PARCITY#3										-0.038	-0.580	0.566	
NAT#0-CITY#0_PARNAT#6-PARCITY#3										0.346	7.360	0.000	***
NAT#0-CITY#0_PARNAT#0-PARCITY#3										0.075	1.380	0.169	
NAT#1-CITY#1_PARNAT#6-PARCITY#0										0.227	4.040	0.000	***
NAT#1-CITY#1_PARNAT#0-PARCITY#0										0.043	0.900	0.366	
NAT#1-CITY#0_PARNAT#6-PARCITY#0										0.721	10.040	0.000	***

Table 8.9: Audit Fee Regression for sub-samples based on clients size (continued)

Panel A: Large Clients

Variables	+/-	Firm national-city framework coef.	t-stat	p-value	sig.	Partner national-city framework coef.	t-stat	p-value	sig.	Joint firm-partner national-city framework coef.	t-stat	p-value	sig.
NAT#1-CITY#0_PARNAT#0-PARCITY#0													
NAT#0-CITY#1_PARNAT#6-PARCITY#0										0.378	4.570	0.000	***
NAT#0-CITY#1_PARNAT#0-PARCITY#0										-0.091	-0.870	0.383	
NAT#0-CITY#0_PARNAT#6-PARCITY#0										0.153	3.840	0.000	***
Corporate Governance													
BODFEM		-0.004	-0.250	0.805		-0.001	-0.080	0.934		0.006	0.370	0.712	
BODFOREIGN		0.082	4.430	0.000	***	0.071	4.260	0.000	***	0.074	4.290	0.000	***
INTAUD		0.146	1.760	0.080	*	0.087	1.210	0.226		0.066	0.900	0.368	
ACSIZE		-0.021	-1.320	0.188		-0.006	-0.390	0.700		-0.011	-0.710	0.477	
ACINDP		0.025	0.970	0.332		0.011	0.430	0.667		0.012	0.460	0.648	
ACFINEXP		0.025	1.700	0.089	*	0.017	1.050	0.293		0.020	1.290	0.199	
ACMEET		0.005	0.290	0.774		0.011	0.630	0.531		0.024	1.320	0.188	
Year fixed-effects			Included				Included				Included		
Industry fixed-effects			Included				Included				Included		
R^2			0.811				0.870				0.880		
N			446				340				340		

Panel B: Small clients

Variables	+/-	Firm national-city framework coef.	t-stat	p-value	sig.	Partner national-city framework coef.	t-stat	p-value	sig.	Joint firm-partner national-city framework coef.	t-stat	p-value	sig.
Intercept		1.530	6.220	0.000	***	1.592	5.660	0.000	***	1.586	5.810	0.000	***
LNAF	+	0.019	2.580	0.005	***	0.018	2.160	0.016	**	0.019	2.290	0.012	***
LTA	+	0.414	13.000	0.000	***	0.399	11.260	0.000	***	0.400	11.510	0.000	***
SQRTSUBS	+	0.052	6.530	0.000	***	0.057	5.890	0.000	***	0.057	6.030	0.000	***
ROI	-	-0.054	-1.050	0.148		-0.037	-0.630	0.265		-0.056	-0.970	0.168	
DE	+	0.062	0.780	0.217		0.168	2.000	0.024	**	0.148	1.780	0.038	**
FOREIGN	+	0.020	0.790	0.216		0.040	1.460	0.073	*	0.025	0.920	0.179	
QUICK	-	-0.010	-4.020	0.000	***	-0.012	-3.400	0.001	***	-0.012	-3.810	0.000	***
CATA	+	0.172	3.380	0.001	***	0.166	2.720	0.004	***	0.186	3.070	0.001	***
OPINION	+	0.034	0.670	0.252		-0.022	-0.440	0.329		-0.034	-0.690	0.246	
LONDON	+	0.022	0.950	0.173		0.033	1.270	0.103		0.031	1.200	0.115	
BUSY	+	0.015	0.760	0.224		0.002	0.110	0.455		0.004	0.210	0.419	
LOSS	+	0.018	0.560	0.288		0.040	1.220	0.111		0.040	1.200	0.115	
INITIAL	-	-0.060	-2.230	0.013	**	-0.059	-2.260	0.012	**	-0.053	-2.010	0.023	**
INSOWN	-	0.011	1.030	0.151		0.008	0.640	0.261		0.004	0.330	0.369	

Table 8.9: Audit Fee Regression for sub-samples based on clients size (continued)

Panel B: Small Clients

		Firm national-city framework				Partner national-city framework				Joint firm-partner national-city framework			
Variables	**+/-**	**coef.**	**t-stat**	**p-value**	**sig.**	**coef.**	**t-stat**	**p-value**	**sig.**	**coef.**	**t-stat**	**p-value**	**sig.**
Industry Specialist Auditor													
Firm national-city framework													
JOINT_NAT#1-CITY#1		0.002	0.090	0.926									
CITY#1_ONLY		-0.025	-1.110	0.268									
NAT#1_ONLY		-0.052	-1.450	0.147									
Partner national-city framework													
JOINT_PARNAT#6-PARCITY#3						0.171	2.150	0.033	**				
PARCITY#3_ONLY						-0.030	-1.330	0.184					
PARNAT#6_ONLY						0.208	2.000	0.046	**				
Joint firm-partner national-city framework													
NAT#1-CITY#1_PARNAT#6-PARCITY#3										0.037	0.500	0.617	
NAT#1-CITY#1_PARNAT#0-PARCITY#3										-0.017	-0.460	0.649	
NAT#1-CITY#0_PARNAT#6-PARCITY#3													
NAT#1-CITY#0_PARNAT#0-PARCITY#3										-0.064	-1.350	0.177	
NAT#0-CITY#1_PARNAT#6-PARCITY#3										-0.048	-0.420	0.671	
NAT#0-CITY#1_PARNAT#0-PARCITY#3										-0.022	-0.690	0.493	
NAT#0-CITY#0_PARNAT#6-PARCITY#3										0.430	2.300	0.022	**
NAT#0-CITY#0_PARNAT#0-PARCITY#3										-0.027	-0.920	0.358	
NAT#1-CITY#1_PARNAT#6-PARCITY#0													
NAT#1-CITY#1_PARNAT#0-PARCITY#0										0.076	2.030	0.044	**
NAT#1-CITY#0_PARNAT#6-PARCITY#0													
NAT#1-CITY#0_PARNAT#0-PARCITY#0										-0.045	-0.690	0.491	
NAT#0-CITY#1_PARNAT#6-PARCITY#0													
NAT#0-CITY#1_PARNAT#0-PARCITY#0										-0.087	-1.540	0.124	
NAT#0-CITY#0_PARNAT#6-PARCITY#0										0.226	2.130	0.034	**
Corporate Governance													
BODFEM		-0.021	-1.420	0.156		-0.024	-1.320	0.186		-0.024	-1.380	0.169	
BODFOREIGN		0.039	2.440	0.015	**	0.036	2.070	0.039	**	0.034	1.880	0.061	*
INTAUD		0.030	1.220	0.222		0.020	0.770	0.443		0.022	0.830	0.409	
ACSIZE		0.003	0.210	0.830		0.005	0.340	0.732		0.009	0.580	0.565	
ACINDP		-0.002	-0.150	0.878		0.000	-0.010	0.994		-0.003	-0.140	0.889	
ACFINEXP		-0.021	-1.900	0.058	*	-0.025	-1.940	0.053	*	-0.024	-1.760	0.079	*
ACMEET		0.029	2.430	0.015	***	0.028	2.070	0.040	**	0.028	2.060	0.040	**
Year fixed-effects			Included				Included				Included		
Industry fixed-effects			Included				Included				Included		
R^2			0.732				0.763				0.776		
N			446				340				340		

*** are significant at p<0.01, ** are significant at p<0.05 and *at p<0.10. All p-values are one-tailed, except for the industry specialist auditor variables, the experimental variables and the corporate governance variables which are two-tailed. Industry fixed-effects and year fixed-effects are not reported for brevity, and t-statistics and significance levels are calculated using the White (1980) robust standard errors to correct for heteroscedasticity. Refer Table 5.8 for definition of variables.

In respect of the corporate governance variables, only *BODFOREIGN* is consistently significant and positive (p<0.10) across all models in both the large and small client sub-samples. This is consistent with the main analysis presented in the last chapter and supports the contention that foreign directors are likely to be less familiar with national accounting rules, laws and regulations, governance standards, and management methods. This is turn makes it more difficult for them to evaluate managerial performance or challenge managerial decisions (Masulis *et al*., 2012), which have an adverse effect on audit risk, requiring the external auditor to perform extra audit work to compensate for this increased audit risk, thus resulting in the charging of higher audit fees. Whereas in the small client sample, there is evidence of negative and significant coefficient for *ACFINEXP* (p<0.10), suggesting that audit committee financial expertise reduces audit risk and auditor effort, contributing to lower fees being charged to small client. In addition, *ACMEET* is significantly positive, indicating that the frequency of audit committee meetings contributes to higher audit fees in the small clients, but not in the large clients.

8.10 Alternative definition for corporate governance variables

This analysis is aimed to examine whether the earlier findings for corporate governance presented in the main analysis of the last chapter are robust to alternative measures of board diversity and audit committee variables. From the main analysis, in respect of board diversity, the proportion of female directors on board is insignificant in all of the models, whereas the proportion of foreign directors on board is consistently positive and significant in all models. Here, two different measures of female directorship and foreign directorship are further tested; 1) two new dummy variables taking the value of 1 for the mere presence of a female director or a foreign director on the board (*BODFEM dummy1* and *BODFOREIGN dummy1*), and 2) two new dummy variables taking the value of 1 when more than a quarter of the board composition is comprised of female directors or foreign directors (*BODFEM dummy2* and *BODFOREIGN dummy2*).

The results are presented in the Table 8.10 below. When the regression model is re-estimated using the first new dummy variable (*BODFEM dummy1*), no significant relationship is reported with audit fees. However, a significant negative relationship between female directorship and audit fees (p<0.05) is evident consistently across all the auditor industry specialist framework models when the variable which represents more than a quarter of the board composition is comprised of female directors (*BODFEM dummy2*). Taken together, these findings suggest that female directorship is only effective in reducing control risk and audit fees when the proportion represents more than a quarter of the board composition. In addition, when the foreign directors on boards are considered, both *BODFOREIGN dummy1* and *BODFOREIGN dummy2* continue to be significant at p<0.01, suggesting that the significant positive association between foreign directorship and audit fees reported in the main analysis of the last chapter is robust to the alternative definitions used in the study.

In respect of audit committee characteristics, while the proportion of audit committee size was never significant in the main analysis, the results in the Table 8.10 below indicate that audit committee size contributes to higher audit fee when it is comprised of at least three members. However, this only occurs in the joint firm-partner national-city framework. Besides that, the relationship between the proportion of audit committee financial expertise and audit fees in the firm joint national-city framework was never significant before. But when the variable is further tested using a dummy variable to represent the presence of at least one audit committee member with accounting or financial expertise, significant negative relationship is reported under the firm national-city framework and partner national-city framework. This suggest that the presence of at least one audit committee member with accounting or financial expertise reduces control risk, thus contribute to less extensive and less expensive audit. Also, consistent with the main analysis, the result for *ACMEET* in Table 8.10 below continues to be positive and significant (except for the firm national-city framework), suggesting that the finding of the *ACMEET* positively contributes to a more extensive and expensive audit based on the number of audit committee meetings or when the audit committee meets at least three times per year.

In addition, following Zaman *et. al* (2011), the four audit committee variables used in this study are pulled together into an audit committee effectiveness (*ACE*) index in this sensitivity test. The construction of this index helps examining the effect of the four audit committee variables collectively on audit fees. The audit committee effectiveness (*ACE*) index is considered effective when it meets all the four criteria as set by the U.K. Corporate Governance Code (2012) as follows: 1) the audit committee is comprised of minimum three members, 2) its members are fully independent, 3) it has got at least one member with a recent and relevant financial experience, and 4) it meets at least three times a year. When the model is ran, the *ACE* variable seems to be positive and significant at $p<0.05$ (except under the firm national-city framework). This finding suggests that it takes beyond than fulfilling this minimum criterion of audit committee effectiveness in order to signal to the auditor the company's corporate governance effectiveness.

Table 8.10: Audit fee regression with alternative measures of corporate governance

		Firm national-city framework				Partner national-city framework				Joint firm-partner national-city framework			
Variables	**+/-**	**coef.**	**t-stat**	**p-value**	**sig.**	**coef.**	**t-stat**	**p-value**	**sig.**	**coef.**	**t-stat**	**p-value**	**sig.**
Experimental variable													
Corporate Governance													
BODFEM dummy1		-0.005	-0.260	0.329		-0.004	-0.230	0.817		-0.007	-0.390	0.699	
BODFEM dummy2		-0.090	-2.080	0.037	**	-0.103	-2.470	0.014	**	-0.107	-2.670	0.008	***
BODFOREIGN dummy1		0.106	5.910	0.000	***	0.084	4.590	0.000	***	0.081	4.480	0.000	***
BODFOREIGN dummy2		0.129	5.500	0.000	***	0.106	4.680	0.000	***	0.108	4.890	0.000	***
ACSIZE dummy		0.006	0.280	0.782		0.033	1.460	0.146		0.046	2.060	0.040	**
ACINDP dummy		0.019	0.690	0.492		0.009	0.320	0.749		0.008	0.260	0.791	
ACFINEXP dummy		-0.102	-2.350	0.019	**	-0.084	-1.980	0.048	**	-0.062	-1.580	0.116	
ACSVEXP		0.010	0.930	0.354		0.000	-0.010	0.993		0.001	0.120	0.905	
ACMEET dummy		0.016	0.740	0.457		0.049	2.290	0.022	**	0.043	1.970	0.049	**
ACE		0.007	0.370	0.709		0.042	2.170	0.030	**	0.040	2.100	0.036	**

*** are significant at p<0.01, ** are significant at p<0.05 and *at p<0.10. All p-values are two-tailed. Industry fixed-effects and year fixed-effects are not reported for brevity, and t-statistics and significance levels are calculated using the White (1980) robust standard errors to correct for heteroscedasticity. Refer Table 5.8 for definition of variables.

8.11 Summary

The findings from the various robustness tests performed in this chapter indicate the fee premium for auditor industry specialisation in the U.K. earned by the Big 4 audit firms who are the joint national and city-specific industry leaders is not merely due to their successful differentiation strategy, but also partly driven by the fee pressure from their closest competitor in the city-industry audit market. Nevertheless, the audit firm's position as a joint national and city industry leader in the U.K. already gives it a sufficient market power to extract a fee premium. This is because there is a distinct (non-interdependency) fee premium attached either to the audit firm's joint national and city industry leadership or to its distance to the closest competitor. Also, female partners are found to have the ability to charge higher fee premiums as compared to male partners. There is no evidence of fee discount reported in the study. Thus, the findings of a fee premium attached to the firm and partner industry leadership support the product differentiation theory and reputation theory, which suggest that auditors differentiate themselves through industry specialisation to meet clients demands for better quality audits and this differentiation strategy is valued in the audit market as it is priced at differentially higher rate than the Big 4 brand name reputation premium.

In respect of the effect of corporate governance on audit and earnings quality, the robustness test using the alternative definition of corporate governance, this study also find evidence that audit fees are higher for companies with 1) more than a quarter of the board composition comprised of female directors, 2) when a dummy variable for only one foreign director on the board is used, and 3) when more than a quarter of the board composition is comprised of foreign directors. Based on the sensitivity and robustness analysis examining the client size effect, the results for the main analysis seems to be driven by large clienteles, but is robust to alternative regression estimators, alternative definition of industry specialist auditor as well as consistent in the presence of endogeneity.

CHAPTER 9

DESCRIPTIVE STATISTICS: THE EFFECT OF INDUSTRY SPECIALIST AUDITORS AND CORPORATE GOVERNANCE ON EARNINGS QUALITY

9.1 Introduction

This chapter begins by outlining the descriptive statistics of the variables employed in the second empirical analysis of this study investigating the influence of industry specialist auditors and corporate governance on earnings quality. The three earnings management proxies that are examined in this study are: 1) the discretionary accruals which control for a firm's performance (based on the model (*DAC_PERF*) developed by Kothari *et al*., 2005); 2) the accrual estimation error (*AEE*), which is based on the Dechow and Dichev (2002) modified accrual quality model modified by McNichols (2002); and 3) the likelihood of reporting a profit (avoiding a loss) model (*PROFIT*) adopted by Francis *et al*. (2013). These earnings management proxies represent the inverse measures of earnings quality. Following prior literature, firms are deemed to have higher earnings quality when accruals are smaller and firms do not avoid reporting losses (Burgstahler and Dichev, 1997; Frankel *et al.*, 2002; Graham *et al.*, 2005; Jones, 1991). Consistent with the last chapter, industry specialist auditor are measured using the national-city framework (either at the firm, partner and combination of both); while the board and audit committee variables are measured in terms of their effectiveness characteristics (e.g. diversity, size, independence, financial expertise and activity).

This chapter is organised as follows: the next section presents the descriptive statistics for each of the earnings quality samples: *DAC_PERF*, *AEE* and *PROFIT*. This is followed by a pairwise correlation matrix which identifies the significant associations among the independent variables examined in each of the earnings quality models.

9.2 Descriptive statistics

This section reports the descriptive statistics and the results of the univariate tests. Panel A of Table 9.1 below presents the descriptive statistics for all the variables for the *DAC_PERF* model. The *DAC_PERF* sample comprises 1,347 observations for the period 2008-2011. This sample size is derived after deleting observations with missing data to calculate the performance-matched discretionary accruals based on the Kothari *et al.* (2005) model. Following Peasnell *et al.* (2005) and Ghosh *et al.* (2010), there has to be at least a minimum of 10 observations per industry per year in order to calculate the *DAC_PERF* and *AEE* for each individual company in the sample. Panel B of Table 9.1 below presents the descriptive statistics for all the variables for the *AEE* model. The *AEE* sample comprises 1,083 observations and was derived after further deleting observations with missing data on the lag and future operating cashflows in order to calculate the accrual estimation error based on the McNichols (2002) model. This section only highlights the descriptive statistics for the different earnings quality proxies, namely *DAC_PERF*, *AEE* and *PROFIT*, as well as the control variables such as *PYTAC*, *GROWTH*, *MB*, *CFO*, *ALTMAN* and *BLOCKOWN*, since the other variables (*LTA*, *DE*, *LOSS*, *BIG4* and *SECOND*) have fairly similar means and standard deviations (as described in Chapter 6.1) in descriptive statistics for the audit fee analysis. Also, all the corporate governance variables for the earnings quality analyses have fairly consistent means and standard deviations, as reported in Chapter 6.1, and are hence not further discussed here.

The mean (median) value for D*AC_PERF* in Panel A and *AEE* in Panel B are 0.104 (0.059) and 0.091 (0.051), respectively. This indicates that there is a very small difference between the two methods of calculating accruals. Other US based studies (e.g. Reichelt and Wang, 2010; Minutti-Meza, 2013) reported comparable mean values of 0.104 and 0.068, respectively.

Panel C of Table 9.1 below presents the descriptive statistics for the variables used in the *PROFIT* model, based on the Francis *et al.* (2013) model. The sample comprises 1,347 observations, similar to the *DAC_PERF* model. Based on the mean *PROFIT*, it seems that on average 66.6 percent of the companies in the sample are reporting a profit instead of a loss in the current year. As some of the variables in the *DAC_PERF* and *PROFIT* model may overlap, only the control variables which are not included in the *DAC_PERF* model (*LAG_LOSS* and *TAC)* are being tabulated and discussed here.

In respect of the control variables, the *PYTAC*, *GROWTH*, *MB*, *CFO*, *ALTMAN* and *BLOCKOWN* for the *DAC_PERF* model and *AEE* model in Panel A and Panel B of Table 9.1 below have comparable means and standard deviations. For the *DAC_PERF* model in Panel A, the mean (standard deviation) for the *PYTAC*, *GROWTH*, *MB*, *CFO*, *ALTMAN* and *BLOCKOWN* are 0.257 (0.456), 0.185 (0.719), 2.308 (1.390), 0.029 (0.238), 0.972 (0.840) and 0.487 (0.204). For the *AEE* model in Panel B, the mean (standard deviation) for the *PYTAC*, *GROWTH*, *MB*, *CFO*, *ALTMAN* and *BLOCKOWN* are 0.241 (0.424), 0.165 (0.613), 2.274 (3.826), 0.070 (0.183), 1.083 (0.764) and 0.475 (0.199). For the *PROFIT* model in Panel C, the mean (standard deviation) for the *LAG_LOSS* and *TAC* are 0.365 (0.482) and 0.116 (0.301), respectively. In comparison to prior studies, Francis *et al.* (2013) reported comparable *MB* of 2.049, whereas Minutti-Meza (2013) reported comparable *CFO* of 0.029. However, the *PYTAC* in Francis *et al.* (2013) and Minutti-Meza (2013) is slightly lower at 0.126 and 0.145, respectively. Also, *GROWTH* and *ALTMAN*, as documented in Francis *et al.* (2013), are slightly higher at 0.216 and 1.804, respectively, whereas lower *LAG_LOSS* is reported at 0.272.

Table 9.1: Descriptive statistics of variables for the earnings quality models

Panel A: *DAC_PERF* Analysis based on the audit firm sample (N=1,347)

	Mean	Median	Standard Deviation	Min	Max
DAC_PERF	0.104	0.059	0.164	0.000	2.503
LTA	8.141	8.030	1.062	5.880	10.640
PYTAC	0.257	0.080	0.456	0.000	2.420
DE	0.116	0.050	0.148	0.000	0.600
GROWTH	0.185	0.050	0.719	-1.000	4.880
MB	2.308	1.390	4.002	-5.870	28.130
CFO	0.029	0.070	0.238	-1.150	0.470
LOSS	0.268	0.000	0.443	0.000	1.000
ALTMAN	0.972	0.840	0.787	-0.020	4.090
BLOCKOWN	0.487	0.490	0.204	0.000	0.990
BIG4	0.649	1.000	0.478	0.000	1.000
SECOND	0.191	0.000	0.393	0.000	1.000
BODFEM	0.056	0.000	0.092	0.000	0.500
BODFOREIGN	0.182	0.091	0.246	0.000	1.000
INTAUD	0.500	0.000	0.500	0.000	1.000
ACSIZE	3.013	3.000	0.922	2.000	7.000
ACINDP	0.943	1.000	0.164	0.000	1.000
ACFINEXP	0.306	0.330	0.258	0.000	1.000
ACMEET	3.077	3.000	1.448	1.000	15.000

Panel B: *AEE* Analysis based on the audit firm sample (N=1,083)

	Mean	Median	Standard Deviation	Min	Max
AEE	0.091	0.051	0.135	0.000	2.293
LTA	8.310	8.200	1.003	5.880	10.640
PYTAC	0.241	0.080	0.424	0.000	2.420
DE	0.131	0.080	0.151	0.000	0.600
GROWTH	0.165	0.060	0.613	-1.000	4.880
MB	2.274	1.405	3.826	-5.870	28.130
CFO	0.070	0.090	0.183	-1.150	0.470
LOSS	0.206	0.000	0.404	0.000	1.000
ALTMAN	1.083	0.950	0.764	-0.020	4.090
BLOCKOWN	0.475	0.475	0.199	0.000	0.990
BIG4	0.711	1.000	0.453	0.000	1.000
SECOND	0.182	0.000	0.386	0.000	1.000
BODFEM	0.063	0.000	0.096	0.000	0.500
BODFOREIGN	0.150	0.000	0.222	0.000	1.000
INTAUD	0.579	1.000	0.494	0.000	1.000
ACSIZE	3.100	3.000	0.930	2.000	7.000
ACINDP	0.947	1.000	0.161	0.000	1.000
ACFINEXP	0.304	0.330	0.255	0.000	1.000
ACMEET	3.191	3.000	1.443	1.000	15.000

Panel C: *PROFIT* Analysis based on the audit firm sample (N=1,347)

	Mean	Median	Standard Deviation	Min	Max
PROFIT	0.666	1.000	0.472	0.000	1.000
LAG_LOSS	0.365	0.000	0.482	0.000	1.000
TAC	0.116	0.065	0.301	0.000	6.974

(Note: All continuous variables have been winsorised at top and bottom 1 percent)
Refer Table 5.8 for definition of variables.

9.3 Correlation matrix

Table 9.2: Pairwise correlation matrix for the earnings quality models

Variables		A	B	C	D	E	F	G	H	I	J	K	L	M
A	DAC_PERF	1.000												
B	PROFIT	-0.252*	1.000											
C	AEE	0.168*	-0.118*	1.000										
D	LTA	-0.256*	0.404*	-0.117*	1.000									
E	DE	-0.173*	0.171*	-0.077*	0.476*	1.000								
F	MB	0.051*	0.052*	-0.038	0.034	-0.004	1.000							
G	LOSS	0.206*	-0.615*	0.140*	-0.404*	-0.180*	-0.045	1.000						
H	GROWTH	0.044	-0.052*	0.088*	-0.057*	0.010	-0.024	0.056*	1.000					
I	CFO	-0.354*	0.496*	-0.148*	0.476*	0.202*	0.008	-0.456*	-0.019	1.000				
J	LAG_LOSS	0.213*	-0.533*	0.164*	-0.438*	-0.173*	-0.054*	0.603*	0.121*	-0.488*	1.000			
K	PPE	-0.004	-0.126*	0.017	-0.170*	-0.076*	0.021	0.177*	0.006	-0.127*	0.114*	1.000		
L	PYTAC	0.126*	-0.121*	0.044	-0.132*	-0.065*	0.034	0.105*	0.100*	-0.111*	0.151*	-0.039	1.000	
M	TAC	0.649*	-0.192*	0.142*	-0.189*	-0.074*	0.0698	0.126*	0.043	-0.313*	0.136*	0.048*	0.040	1.000
N	ALTMAN	-0.143*	0.298*	-0.124*	0.078*	-0.100*	0.080*	-0.277*	-0.088*	0.263*	-0.312*	-0.038	-0.081*	-0.102*
O	BIG4	-0.184*	0.268*	-0.054*	0.615*	0.295*	0.063*	-0.263*	-0.076*	0.282*	-0.294*	-0.098*	-0.111*	-0.134*
P	SECOND	0.030	-0.084*	0.019	-0.324*	-0.161*	-0.032	0.073*	0.008	-0.139*	0.095*	0.082*	0.043	0.022
Q	BLOCKOWN	0.044*	-0.132*	0.061*	-0.338*	-0.154*	-0.045	0.129*	0.061*	-0.089*	0.162*	0.062*	0.061*	0.047*
R	BODFEM	-0.088*	0.182*	-0.030	0.324*	0.110*	0.080*	-0.130*	-0.061*	0.175*	-0.200*	-0.029	-0.074*	-0.073*
S	BODFOREIGN	0.131*	-0.186	0.049	-0.046*	-0.064*	0.009	0.192*	0.105*	-0.103*	0.222*	0.043	0.019	0.072*
T	INTAUD	-0.234*	0.371*	-0.131*	0.707*	0.368*	0.065*	-0.346*	-0.075*	0.366*	-0.430*	-0.133*	-0.127*	-0.149*
U	ACSIZE	-0.132*	0.233*	-0.051*	0.548*	0.256*	0.095*	-0.231*	-0.042	0.223*	-0.252*	-0.100*	-0.101*	-0.105*
V	AZINDP	-0.051*	0.126*	-0.007	0.158*	0.058*	0.069*	-0.178*	-0.015	0.109*	-0.151*	-0.139*	0.001	-0.035
W	ACFINEXP	0.014	0.051*	-0.073*	0.199*	0.113*	0.017	-0.076*	-0.031	0.032	-0.043	-0.057*	0.007	-0.013
X	ACMEET	-0.122*	0.199*	-0.090*	0.554*	0.208*	0.043	-0.217*	-0.025	0.217*	-0.237*	-0.105*	-0.085*	-0.120*
Y	NAT#1	-0.125*	0.137*	-0.093*	0.349*	0.148*	0.057*	-0.145*	-0.044	0.160*	-0.180*	-0.036	-0.083*	-0.072*
Z	CITY#1	-0.129*	0.134*	-0.062*	0.361*	0.207*	0.051*	-0.144*	-0.050*	0.131*	-0.182*	-0.047*	-0.086*	-0.089*
AA	JOINT_NAT#1-CITY#1	-0.134*	0.126*	-0.097*	0.376*	0.158*	0.067*	-0.141*	-0.037	0.161*	-0.178*	-0.045*	-0.096*	-0.079*
BB	CITY#1_ONLY	-0.017	0.036	0.038	0.048*	0.105*	-0.011	-0.030	-0.029	-0.017	-0.040	-0.012	-0.002	-0.026
CC	NAT#1_ONLY	0.004	0.042	-0.001	-0.016	-0.003	-0.014	-0.026	-0.022	0.018	-0.026	0.016	0.020	-0.001
DD	PARNAT#1	-0.060*	0.105*	-0.068*	0.373*	0.166*	0.088*	-0.071*	-0.035	0.067*	-0.080*	-0.037	-0.051*	-0.037
EE	PARCITY#1	-0.083*	0.099*	-0.040	0.272*	0.143*	0.047	-0.118*	-0.037	0.113*	-0.131*	-0.026	-0.047	-0.066*
FF	PARJOINT_PARTNAT#1-PARCITY#1	-0.060*	0.105*	-0.068*	0.373*	0.166*	0.088*	-0.071*	-0.035	0.067*	-0.080*	-0.037	-0.051*	-0.037
GG	PARCITY#1_ONLY	-0.057*	0.051	-0.004	0.092*	0.065*	0.003	-0.090*	-0.021	0.087*	-0.100*	-0.009	-0.024	-0.047
HH	PARNAT#1_ONLY	.	.	.	.	.	.	.	.	.	.	.	.	.
II	NAT#1-CITY#1_PARNAT#1-PARCITY#1	-0.059*	0.103*	-0.068*	0.370*	0.169*	0.089*	-0.069*	-0.035	0.067*	-0.077*	-0.036	-0.050	-0.036
JJ	NAT#1-CITY#1_PARNAT#0-PARCITY#1	-0.046	-0.013	0.012	0.056*	-0.035	0.025	-0.034	-0.013	0.086*	-0.055*	-0.009	-0.028	-0.028
KK	NAT#1-CITY#0_PARNAT#1-PARCITY#1	.	.	.	.	.	.	.	.	.	.	.	.	.
LL	NAT#1-CITY#0_PARNAT#1-PARCITY#1	.	.	.	.	.	.	.	.	.	.	.	.	.
MM	NAT#0-CITY#1_PARNAT#1-PARCITY#1	-0.016	0.022	-0.008	0.046	-0.005	-0.002	-0.020	-0.004	0.010	-0.024	-0.006	-0.015	-0.007
NN	NAT#0-CITY#1_PARNAT#0-PARCITY#1	-0.021	0.055*	-0.012	0.049	0.089*	-0.007	-0.068*	-0.037	0.025	-0.057*	0.002	-0.016	-0.031

*is significant at *p*<0.10. All p-values are two-tailed. Variables PARNAT#1_ONLY (HH), NAT#1-CITY#0_PARNAT#1-PARCITY#1 (KK) and NAT#1-CITY#0_PARNAT#1-PARCITY#1 (LL) have empty cells due to missing observations. Refer Table 5.8 for definition of variables.

Table 9.2: Pairwise correlation matrix for the earnings quality models (continued)

Variables		A	B	C	D	E	F	G	H	I	J	K	L	M
OO	NAT#0-CITY#0_PARNAT#1-PARCITY#1	.	.	.	.	.	.	.	.	.	.	.	.	.
PP	NAT#0-CITY#0_PARNAT#0-PARCITY#1	-0.042	0.065*	-0.012	0.064*	0.0780*	-0.034	-0.060*	0.058*	0.040	-0.072*	-0.015	0.027	-0.017
QQ	NAT#1-CITY#1_PARNAT#1-PARCITY#0	.	.	.	.	.	.	.	.	.	.	.	.	.
RR	NAT#1-CITY#1_PARNAT#0-PARCITY#0	-0.095*	0.098*	-0.076*	0.217*	0.100*	0.021	-0.109*	-0.037	0.116*	-0.123*	-0.033	-0.078*	-0.050
SS	NAT#1-CITY#0_PARNAT#1-PARCITY#0	.	.	.	.	.	.	.	.	.	.	.	.	.
TT	NAT#1-CITY#0_PARNAT#0-PARCITY#0	0.013	0.042	0.001	-0.026	0.010	-0.020	-0.017	-0.014	0.032	-0.016	0.017	0.038	0.002
UU	NAT#0-CITY#1_PARNAT#1-PARCITY#0	.	.	.	.	.	.	.	.	.	.	.	.	.
VV	NAT#0-CITY#1_PARNAT#0-PARCITY#0	-0.007	-0.033	0.067*	-0.008	0.054*	-0.030	0.033	-0.013	-0.064*	0.016	-0.028	-0.027	-0.005
WW	NAT#0-CITY#0_PARNAT#1-PARCITY#0	.	.	.	.	.	.	.	.	.	.	.	.	.

Variables		N	O	P	Q	R	S	T	U	V	W	X	Y	Z
N	ALTMAN	1.000												
O	BIG4	0.135*	1.000											
P	SECOND	-0.025	-0.659*	1.000										
Q	BLOCKOWN	-0.052*	-0.180*	0.152*	1.000									
R	BODFEM	0.157*	0.166*	-0.082*	-0.176*	1.000								
S	BODFOREIGN	-0.293*	-0.176*	0.004	0.110*	-0.059*	1.000							
T	INTAUD	0.182*	0.518*	-0.292*	-0.293*	0.280*	-0.130*	1.000						
U	ACSIZE	0.087*	0.379*	-0.215*	-0.250*	0.302*	-0.021	0.403*	1.000					
V	ACINDP	0.031	0.153*	-0.040	-0.076*	0.075*	-0.114*	0.174*	0.017	1.000				
W	ACFINEXP	-0.007	0.146*	-0.131*	-0.045	0.017	-0.055*	0.154*	0.031	0.080*	1.000			
X	ACMEET	0.037	0.353*	-0.205*	-0.219*	0.188*	0.045*	0.455*	0.391*	0.109*	0.168*	1.000		
Y	NAT#1	0.113*	0.407*	-0.268*	-0.146*	0.104*	-0.040	0.250*	0.199*	0.075*	0.121*	0.122*	1.000	
Z	CITY#1	0.091*	0.478*	-0.315*	-0.165*	0.102*	-0.095*	0.271*	0.207*	0.091*	0.122*	0.153*	0.683*	1.000
AA	JOINT_NAT#1-CITY#1	0.098*	0.370*	-0.244*	-0.177*	0.139*	-0.013	0.275*	0.217*	0.097*	0.123*	0.147*	0.908*	0.774*
BB	CITY#1_ONLY	0.007	0.238*	-0.157*	-0.015	-0.032	-0.131*	0.045*	0.026	0.010	0.022	0.037	-0.179*	0.497*
CC	NAT#1_ONLY	0.048*	0.135*	-0.089*	0.052*	-0.067*	-0.066*	-0.025	-0.016	-0.040	0.011	-0.042	0.331*	-0.119*
DD	PARNAT#1	-0.056*	0.146*	-0.095*	-0.233*	0.156*	0.157*	0.174*	0.282*	0.025	0.127*	0.191*	0.347*	0.306*
EE	PARCITY#1	0.093*	0.336*	-0.220*	-0.211*	0.050	-0.058*	0.223*	0.180*	0.070*	0.098*	0.134*	0.323*	0.654*
FF	PARJOINT_PARTNAT#1-PARCITY#1	-0.056*	0.146*	-0.095*	-0.233*	0.156*	0.157*	0.174*	0.282*	0.025	0.127*	0.191*	0.347*	0.306*
GG	PARCITY#1_ONLY	0.135*	0.291*	-0.190*	-0.104*	-0.033	-0.152*	0.150*	0.042	0.063*	0.037	0.041	0.163*	0.553*
HH	PARNAT#1_ONLY	.	.	.	.	.	.	.	.	.	.	.	.	.
II	NAT#1-CITY#1_PARNAT#1-PARCITY#1	-0.058*	0.144*	-0.094*	-0.230*	0.156*	0.158*	0.170*	0.274*	0.023	0.127*	0.187*	0.354*	0.302*
JJ	NAT#1-CITY#1_PARNAT#0-PARCITY#1	0.176*	0.178*	-0.116*	-0.080*	-0.032	-0.076*	0.096*	0.026	0.056*	0.068*	0.025	0.438*	0.373*
KK	NAT#1-CITY#0_PARNAT#1-PARCITY#1	.	.	.	.	.	.	.	.	.	.	.	.	.
LL	NAT#1-CITY#0_PARNAT#1-PARCITY#1	.	.	.	.	.	.	.	.	.	.	.	.	.
MM	NAT#0-CITY#1_PARNAT#1-PARCITY#1	0.007	0.023	-0.015	-0.035	0.014	0.002	0.032	0.066*	0.010	0.011	0.041	-0.017	0.048
NN	NAT#0-CITY#1_PARNAT#0-PARCITY#1	0.021	0.203*	-0.133*	-0.066*	-0.019	-0.112*	0.079*	0.017	0.024	-0.001	0.029	-0.153*	0.426*
OO	NAT#0-CITY#0_PARNAT#1-PARCITY#1	.	.	.	.	.	.	.	.	.	.	.	.	.
PP	NAT#0-CITY#0_PARNAT#0-PARCITY#1	0.005	0.069*	-0.045	-0.001	0.011	-0.060*	0.096*	0.043	0.030	-0.029	0.008	-0.052*	-0.061*
QQ	NAT#1-CITY#1_PARNAT#1-PARCITY#0	.	.	.	.	.	.	.	.	.	.	.	.	.
RR	NAT#1-CITY#1_PARNAT#0-PARCITY#0	0.047	0.253*	-0.165*	-0.025	0.138*	-0.037	0.171*	0.114*	0.044	0.043	0.053*	0.623*	0.530*
SS	NAT#1-CITY#0_PARNAT#1-PARCITY#0	.	.	.	.	.	.	.	.	.	.	.	.	.
TT	NAT#1-CITY#0_PARNAT#0-PARCITY#0	0.032	0.140*	-0.091*	0.055*	-0.071*	-0.071*	-0.027	-0.028	-0.044	0.011	-0.044	0.344*	-0.124*

*is significant at *p*<0.10. All p-values are two-tailed. Variables with empty cells are due to missing observations. Refer Table 5.8 for definition of variables.

Table 9.2: Pairwise correlation matrix for the earnings quality models (continued)

Variables		**N**	**O**	**P**	**Q**	**R**	**S**	**T**	**U**	**V**	**W**	**X**	**Y**	**Z**
UU	NAT#0-CITY#1_PARNAT#1-PARCITY#0	.	.	.	.	.	.	.	.	.	.	.	.	.
VV	NAT#0-CITY#1_PARNAT#0-PARCITY#0	-0.023	0.118*	-0.077*	0.073*	-0.042	-0.064*	-0.046	0.002	0.020	0.018	0.020	-0.089*	0.248*
WW	NAT#0-CITY#0_PARNAT#1-PARCITY#0	.	.	.	.	.	.	.	.	.	.	.	.	.
Variables		**AA**	**BB**	**CC**	**DD**	**EE**	**FF**	**GG**	**HH**	**II**	**JJ**	**KK**	**LL**	**MM**
AA	JOINT_NAT#1-CITY#1	1.000												
BB	CITY#1_ONLY	-0.163*	1.000											
CC	NAT#1_ONLY	-0.092*	-0.059*	1.000										
DD	PARNAT#1	0.386*	-0.049	-0.038	1.000									
EE	PARCITY#1	0.383*	0.491*	-0.087*	0.433*	1.000								
FF	PARJOINT_PARTNAT#1-PARCITY#1	0.386*	-0.049	-0.038	1.000*	0.433*	1.000							
GG	PARCITY#1_ONLY	0.208*	0.570*	-0.075*	-0.079*	0.863*	-0.079*	1.000						
HH	PARNAT#1_ONLY	.	.	.	.	.	.	.	.					
II	NAT#1-CITY#1_PARNAT#1-PARCITY#1	0.393*	-0.064*	-0.038	0.986*	0.427*	0.986*	-0.078*	.	1.000				
JJ	NAT#1-CITY#1_PARNAT#0-PARCITY#1	0.486*	-0.080*	-0.047	-0.049	0.529*	-0.049	0.612*	.	-0.048	1.000			
KK	NAT#1-CITY#0_PARNAT#1-PARCITY#1	.	.	.	.	.	.	.	.	.	.	.		
LL	NAT#1-CITY#0_PARNAT#1-PARCITY#1	.	.	.	.	.	.	.	.	.	.	.	.	
MM	NAT#0-CITY#1_PARNAT#1-PARCITY#1	-0.016	0.095*	-0.006	0.157*	0.068*	0.157*	-0.012	.	-0.006	-0.008	.	.	1.000
NN	NAT#0-CITY#1_PARNAT#0-PARCITY#1	-0.138*	0.842*	-0.053*	-0.055*	0.603*	-0.055*	0.699*	.	-0.054*	-0.067*	.	.	-0.009
OO	NAT#0-CITY#0_PARNAT#1-PARCITY#1	.	.	.	.	.	.	.	.	.	.	.	.	.
PP	NAT#0-CITY#0_PARNAT#0-PARCITY#1	-0.047	-0.031	-0.018	-0.019	0.205*	-0.019	0.237*	.	-0.019	-0.023	.	.	-0.003
QQ	NAT#1-CITY#1_PARNAT#1-PARCITY#0	.	.	.	.	.	.	.	.	.	.	.	.	.
RR	NAT#1-CITY#1_PARNAT#0-PARCITY#0	0.691*	-0.113*	-0.066*	-0.068*	-0.158*	-0.068*	-0.137*	.	-0.068*	-0.084*	.	.	-0.011
SS	NAT#1-CITY#0_PARNAT#1-PARCITY#0	.	.	.	.	.	.	.	.	.	.	.	.	.
TT	NAT#1-CITY#0_PARNAT#0-PARCITY#0	-0.095*	-0.063*	1.000*	-0.038	-0.087*	-0.038	-0.075*	.	-0.038	-0.047	.	.	-0.006
UU	NAT#0-CITY#1_PARNAT#1-PARCITY#0	.	.	.	.	.	.	.	.	.	.	.	.	.
VV	NAT#0-CITY#1_PARNAT#0-PARCITY#0	-0.080*	0.490*	-0.031	-0.032	-0.074*	-0.032	-0.064*	.	-0.032	-0.039	.	.	-0.005
WW	NAT#0-CITY#0_PARNAT#1-PARCITY#0	.	.	.	.	.	.	.	.	.	.	.	.	.
Variables		**NN**	**OO**	**PP**	**QQ**	**RR**	**SS**	**TT**	**UU**	**VV**	**WW**			
NN	NAT#0-CITY#1_PARNAT#0-PARCITY#1	1.000												
OO	NAT#0-CITY#0_PARNAT#1-PARCITY#1	.	.											
PP	NAT#0-CITY#0_PARNAT#0-PARCITY#1	-0.026	.	1.000										
QQ	NAT#1-CITY#1_PARNAT#1-PARCITY#0	.	.	.	.									
RR	NAT#1-CITY#1_PARNAT#0-PARCITY#0	-0.095*	.	-0.033	.	1.000								
SS	NAT#1-CITY#0_PARNAT#1-PARCITY#0	.	.	.	.	.	.							
TT	NAT#1-CITY#0_PARNAT#0-PARCITY#0	-0.053*	.	-0.018	.	-0.066*	.	1.000						
UU	NAT#0-CITY#1_PARNAT#1-PARCITY#0	.	.	.	.	.	.	.	.					
VV	NAT#0-CITY#1_PARNAT#0-PARCITY#0	-0.045	.	-0.015	.	-0.055*	.	-0.031	.	1.000				
WW	NAT#0-CITY#0_PARNAT#1-PARCITY#0	.	.	.	.	.	.	.	.	.	.			

*is significant at *p*<0.10. All p-values are two-tailed. Variables with empty cells are due to missing observations. Refer Table 5.8 for definition of variables.

Table 9.2 represents the correlation matrix showing two-way Pearson correlations between all variables included in the earnings quality analyses of this study. The single asterisks in Table 9.2 above signify statistically significant correlations at p<0.10. In general, the overall correlation matrix shows that the earnings quality measures and the independent variables (i.e. board diversity, internal audit, audit committee and related control variables) are moderately inter-correlated with one another except for variables *LAF* and *LTA* (correlation coefficients of 88.5 percent), *JOINT_NAT#1-CITY#1* and *NAT#1* (correlation coefficients of 89.53 percent), *CITY#1_ONLY* and PARCITY#1 (correlation coefficients of 85.4 percent), and *JOINT_NAT#1-CITY#1* and *CITY#1* (correlation coefficients of 72.96 percent), which have the largest correlation coefficients above 70 percent.

The coefficient for *PARJOINT_PARNAT#1-PARCITY#1* and *PARNAT#1* is perfectly correlated at 1.00. This is because all the partners who are national industry leaders are also leaders at the city level. While *NAT#1-CITY#0_PARNAT#0PARCITY#0* and *NAT#1_ONLY* are perfectly correlated (coefficient= 1.00). These findings of perfect correlation and high correlation (above 0.7) between the industry specialist variables do not represent a multicollinearity problem as these identified highly and perfectly correlated variables are not tested simultaneously in the same regression model. Diagnostics on the multicollinearity associated with each empirical model using the Variance Inflation Factor (VIF) are previously provided in Chapter 5.

Besides that, as reported in Table 9.2 above, *DAC_PERF*, *AEE* and *PROFIT* are significantly correlated with the determinants of earnings quality reported in prior literature (Reichelt and Wang, 2010; Minutti-Meza, 2013; Francis *et al*., 2013). *DAC_PERF* and *AEE* are both positively associated with *LOSS* and *BLOCKOWN*, but negatively associated with *LTA*, *DE*, *CFO*, *ALTMAN* and *BIG4*. *PROFIT*, however, is positively correlated with *LTA*, *DE*, *MB*, *CFO*, *ALTMAN* and *BIG4*, but negatively correlated with *LOSS*, *GROWTH*, *LAG_LOSS*, *PPE* and *SECOND*.

The corporate governance coefficients in Table 9.2 indicate that internal audit (*IA*) and audit committee characteristics (*ACSIZE*, *ACMEET*) are consistently significantly negatively correlated with both measures of accruals (*DAC_PERF* and *AEE*). This suggests that the presence of a strong internal control environment and an active audit committee contributes to better quality of reported earnings. However, the relationship between the corporate governance variables and *PROFIT* seemed to be mixed. For the industry specialist variables, audit firms with industry leadership at the *NAT#1*, *CITY#1*, *JOINT_NAT#1-CITY#1*, *PARNAT#1*, *PARJOINT_PARNAT#1-PARCITY#1*, *NAT#11-CITY#1_PARN1T#1-PARCITY#1*, and *NAT#1-CITY#1_PARNAT#0-PARCITY#0* are significantly negatively correlated with *DAC_PERF* and *AEE*, indicating the effectiveness of the industry specialist auditors in constraining earnings management. Because these correlations are pair-wise, the coefficient sign may differ in the multivariate analysis (Reichelt and Wang, 2010).

CHAPTER 10

FINDINGS AND DISCUSSIONS: THE EFFECT OF INDUSTRY SPECIALIST AUDITORS AND CORPORATE GOVERNANCE ON EARNINGS QUALITY

10.1 Introduction

The descriptive statistics for the earnings management models have been discussed in the previous chapter. Next, multivariate regression will be performed in this chapter to examine the effect of industry specialist auditors and corporate governance on earnings quality.

10.2 Multivariate regression

As explained in Chapter 5 in the model specification section, the three earnings management proxies that will be examined in this study are: 1) the discretionary accruals which control for a firm's performance (*DAC_PERF*) and which are based on a model by Kothari *et al*. (2005); 2) the accrual estimation error (*AEE*) based on Dechow and Dichev's (2002) accrual quality model which modifies the model developed by McNichols (2002); and 3) the likelihood of reporting a profit or avoiding a loss (*PROFIT*) model adopted from Francis *et al*. (2013).

Following prior literature, firms are deemed to have higher earnings or audit quality when accruals are smaller and firms do not avoid reporting losses (Jones 1991; Burgstahler and Dichev 1997; Frankel *et al*. 2002; Graham *et al*., 2005). Similar to the multivariate analyses performed for audit pricing analyses in Chapter 7, the earnings management analyses in this chapter will be performed using the same three different levels of analysis for auditor industry specialisation: 1) the firm national-city framework, 2) the partner national-city framework, and 3) the joint firm-partner national-city framework.

Similar to the analysis on the effect of industry specialist auditors and corporate governance on audit quality (as proxy by the variation in the level of audit fees) in Chapter 7, three models are reported for comparative purposes under the firm national-city framework and partner national-city framework analyses. This approach to analysis is consistent with Reichelt and Wang (2010) who, in their study, examine the effect of national and office specific measures of auditor industry expertise on audit quality at the audit firm level using the firm national-city framework. The three models are explained as follows: Model 1 tests the effect of firm (partner) national industry leadership and corporate governance on earnings quality. Model 2, on the other hand, tests the effect of firm (partner) city-*specific* industry leadership and corporate governance on earnings quality. Model 1 and Model 2 are provided for completeness, while Model 3 represents the model of interest as it controls for the joint effect of the audit firm's national and city industry leadership and corporate governance on the three different measures of earnings quality employed in the study.

In addition, as applied under the analysis on the effect of industry specialist auditors and corporate governance on audit quality (as proxy by the variation in the level of audit fees) in Chapter 7, the determination of the national industry leader in Model 1 and the city-specific industry leader in Model 2, respectively, is based on an iterative process. The iterative process starts with only one indicator variable for the nationally top-ranked leader in the first estimation, and then adds a second indicator variable for the second-ranked leader in the second estimation, and so on until the introduction of an additional ranking variable is not statistically significant, or, in other words, it does not have an effect on earnings quality. This iterative process will determine the top-ranked Big 4 industry leaders which have a significant coefficient relative to the remaining audit firms who are not Big 4 industry leaders. Consequently, the determination of the joint national-city industry leader in Model 3 would be derived from the combination of the top-ranked leaders as identified in Model 1 and Model 2, respectively. Significance levels for model coefficients are reported as one-tailed *p*-values, except for the industry specialist auditors and corporate governance variables which are reported as two-tailed *p*-values. Industry fixed-effects and year fixed-effects are not reported for brevity, and *t*-statistics and *p*-values are calculated using the White (1980) robust standard errors to correct for heteroscedasticity[21].

10.2.1 Firm national-city framework

In this section, the study will examine the effect of industry specialist auditor and corporate governance on earnings quality under the firm national-city framework. Table 10.1 to Table 10.4, below present the results based on the three different measures of earnings quality applied in this chapter: discretionary accruals models (*DAC_PERF*), accrual estimation error (*AEE*) and the likelihood of reporting a profit rather than a loss (*PROFIT*).

10.2.1.1 Performance-matched discretionary accruals (*DAC_PERF*)

Table 10.1 reports the results of the three model estimations for the *DAC_PERF* using the national and city framework for auditor industry specialisation, while controlling for the effects of corporate governance in the models. Discretionary accruals represent the amount of a company's abnormal or unexpected accruals and is the amount of earnings that have been potentially distorted through managerial discretion (i.e. earnings management) (Reichelt and Wang, 2010). The analysis in this section focuses on both the magnitude of the discretionary accruals as well as the direction. Table10. 1 below presents the results examining the effect of industry specialist auditors and corporate

[21] According to Petersen (2009) and Gow *et al.* (2010), the use of OLS or White (1980) standard error fails to correct for both cross-sectional and time-series dependence in panel data, and thus produces mis-specified test-statistics and invalid inferences about the relationship of the variables examined. Instead, the econometric literature suggests that the two-way cluster robust standard errors is to both time-series and cross-sectional correlation (Thompson, 2006; Petersen, 2009). Thus, a sensitivity analysis is performed in the next chapter in Section 11.2, where all the regressions are re-estimated using 1) one-way cluster robust standard error clustered by firm, and 2) two-way cluster robust standard error clustered by firm and year.

governance in reducing the magnitude of discretionary accruals, whereas Table 10.2 presents the results of the analysis examining the effect of industry specialist auditors and corporate governance on both income-increasing and income-decreasing discretionary accruals.

All models in Table 10.1 below have an R^2 value ranging from 21.2 percent to 21.4 percent and are significant ($p<0.01$), suggesting that the models are statistically valid. These R^2 values, although lower compared to Reichelt and Wang (2010) at about 42 percent, are still higher relative to prior studies by Ghosh *et al*. (2010), Baxter and Cotter (2009) and Kent *et al*., (2010), who have reported their R^2 values as 8.28 per cent, 9.8 percent and 2.8 percent, respectively. These previous studies have used U.S. data prior to 2006 whilst this study is using more recent U.K. data between the period 2008 to 2011.

Model 1 in Table 10.1 below tests the effect of the firm national industry leadership and corporate governance in reducing the magnitude of discretionary accruals on the company's reported profit, relative to other audit firms who are not Big 4 industry leaders. The iterative process results indicate that the top-ranked and the second-ranked audit firm in the industry nationally, respectively, reduces discretionary accruals, but not the third ranked firm in the industry. The coefficient for the top-ranked national and the second-ranked national leaders are both negative and significant (coefficient = -0.023, $p<0.05$ and coefficient = -0.025, $p<0.05$, respectively), whereas when the third-ranked auditor indicator variable is tested, it is not significant at any conventional level. An F-test indicates there is no significant difference between the coefficients for the top-ranked and second-ranked audit firms who are the industry leaders nationally (F-statistic=0.050, p=0.818). Thus, following on from the discussion above, the results for Model 1 reported in Table 10.1 use a single auditor indicator variable that takes on the value of 1 if an audit firm is either the top-ranked or second-ranked firm in an industry (*NAT#2*) and tests the effect of national-level industry leadership *per se* on reducing the magnitude of discretionary accruals for 571 observations in which the top two Big 4 auditors are the national industry leaders, and the default comparison group is all of the remaining 776 observations not having Big 4 national industry leaders. The *NAT#2* coefficient value is -0.024 and significant at $p<0.05$. This finding is consistent with studies by Krishnan *et al*. (2003), Balsam *et al*. (2003), Kwon *et al*. (2007), Prawitt *et al*. (2009), Reichelt and Wang (2010), Cahan *et al*. (2011) and Minutti Meza (2013) which also have reported that earnings quality is higher when the client is audited by an audit firm that is a national industry leader, as then earnings management is constrained effectively by having the specialist audit firm reducing the magnitude of discretionary accruals on the company's reported profit. Prawitt *et al*. (2009), Reichelt and Wang (2010), Cahan *et al*. (2011) and Minutti-Meza (2013), as in this study, used the performance-matched discretionary accruals model. Krishnan *et al*. (2003) and Balsam *et al*. (2003) used the Jones (1991) discretionary accruals model, whereas Kwon *et al*. (2007) used both the modified Jones (1991) discretionary current accruals adapted from Teoh *et al*. (1998) and Guenther (1994).

Model 2 in Table 10.1 below tests the effect of the Big 4 firm city-specific industry leadership and corporate governance in reducing the magnitude of discretionary accruals on the company's reported profit, relative to other non-Big 4 industry leaders. The results of the iterative process indicates that only the coefficient for the top-ranked firm is negative and significant (coefficient=-0.016, $p<0.10$), whereas when the second-ranked auditor indicator variable is tested, it is not significant at any conventional level. Thus, the results for Model 2 in Table 10.1 use a single auditor indicator variable that takes on the value of 1 if the audit firm is the top-ranked firm in a city-specific industry (*CITY#1*), and tests the effect of city-level industry leadership *per se* in constraining discretionary accruals for 401 observations in which the top-ranked Big 4 auditor is the city industry leader, and the default comparison group is all of the remaining 946 observations not having Big 4 city industry leaders. This finding is consistent with studies by Sun and Liu (2013), Choi *et al*. (2010), Reichelt and Wang (2010), Cahan *et al*. (2011) and Minutti-Meza (2013) who have also reported that when an audit firm is a city industry leader they promote higher earnings quality by reducing the magnitude of discretionary accruals on the company's reported profit.

While Models 1 and Model 2 above are provided for completeness, Model 3 in Table 10.1 below is the primary model of interest because it controls explicitly for the joint effect of national and city-specific industry leadership through the use of a combination of three auditor indicator variables. The first auditor indicator variable is coded 1 for 337 observations (25 percent of sample) in which the audit firm is jointly the top-two ranked national leaders and the top-ranked city-specific industry leader; the second auditor indicator variable is coded 1 for 64 observations (5 percent of sample) in which the audit firm is the top-ranked city-specific industry leader but is not in the top two for national leaders, and the third auditor indicator variable is coded 1 for 234 observations (17 percent of sample) in which the auditor is in the top two for national industry leaders but is not the top city-specific industry leader. In other words, companies with audit firms that are national industry leaders (N=571) can be decomposed into those audited by national leaders alone (N=234), plus those audited by audit firms who are joint national and city-specific industry leaders (N=337). Similarly, companies with auditors that are city-specific industry leaders (N=401) can be decomposed into those audited by city-specific industry leaders alone (N=64), plus those auditors that are jointly national and city-specific industry leaders (N=337). The purpose of these three partitions is to test for the separate effects of national and city-specific industry leadership on the magnitude of discretionary accruals, as well as to isolate the joint effect of national and city-specific industry leadership on pricing the magnitude of discretionary accruals. The default comparison group is the 712 observations (53 percent of sample) in which the audit firm is neither the top two national leaders nor top city industry leader.

Results of Model 3 in Table 10. 1 below shows that the coefficients for *JOINT_NAT#2-CITY#1* and *NAT#1_ONLY* are negative and significant (coefficient=-0.030, $p<0.01$ and coefficient=-0.021, $p<0.10$ respectively), while the coefficient for *CITY#1_ONLY* is not significant at any conventional level. This indicates that the Big 4 audit firms which are joint national-city industry leaders and the national industry leaders alone reduce the magnitude of discretionary accruals, but not when they are city industry leaders alone. An F-test indicates there is no significant difference between the coefficients for the joint national and city-specific industry leaders and the national leader alone (*F*-statistic=0.990, *p*=0.321). This finding suggests that earnings quality is higher (smaller discretionary accruals) when the audit firm is a national industry leader, either alone or in conjunction with city industry leadership. In other words, an audit firm's national industry leadership is an important condition to constrain accrual-based earnings management. This finding is in contrast to Choi *et al*. (2010) who have documented in the U.S. in the period 2000 to 2005 that the effect of office-level industry expertise dominates the effect of national-level industry expertise in deterring management opportunistic earnings manipulation. On the other hand, the study by Reichelt and Wang (2010) in the U.S. during the period 2003 to 2007 reported that the joint national and city industry leadership is more important than city industry leadership in constraining discretionary accruals.

The coefficients for national industry leaders in Model 3, either alone or in conjunction with city industry leadership, are as low as -0.021 and as high as -0.030, respectively. The magnitude of these coefficients is to be in the range of 26.25 percent to 37.5 percent of pre-tax earnings, based on mean pre-tax earnings (scaled by lagged assets) of 0.08 in the sample[22]. In other words, one U.K. sterling pound increase or decrease in company pre-tax earnings due to discretionary accruals is moderated significantly by national industry leaders, either alone or in conjunction with city industry leadership, by 26.25 pence to 37.5 pence, on average. Clearly the U.K. sterling pound impact of smaller discretionary accruals has a material effect on earnings using the standard five percent rule-of-thumb, and the earnings per share effect may be even more important where even one pence per share matters. Thus, it can be concluded that the impact of national level auditor industry leadership on discretionary accruals in the U.K. is both statistically and economically significant during the period 2008-2011.

In relation to board diversity, the coefficients for *BODFEM* and *BODFOREIGN* are both insignificant (*p*>0.10). This insignificant finding for *BODFEM* is in contrast to Srinidhi *et al*. (2011) who report that the proportion of female directors on boards reduces the magnitude of discretionary accruals. While *INTAUD* is insignificant across all the three models at *p*<0.10, this finding is consistent with Davidson *et al*. (2005) but is in contrast to prior studies by Prawitt *et al*. (2009) which report that an internal audit represents a detection and deterrent mechanism that moderates earnings management. In respect of the audit committee characteristics, the results in this study contradict earlier findings (for example, Abbott *et al*., 2000; Klein, 2002; Abbott *et al*., 2004; Davidson *et al*., 2005) which documented the occurrence of earnings management decreases with independence of the audit committee, but they are consistent with Choi *et al*. (2004), Lin *et al*. (2006) and Xie *et al*. (2003) who

[22] Coefficients on the auditor indicator variables measure the average change (due to the auditor variable) in the dependent variable which is the absolute value of discretionary accruals scaled by lagged assets. Following Reichelt and Wang (2010), the magnitude is computed by dividing each coefficient on the auditor indicator variables by the absolute value of mean pre-tax earnings in the sample, also scaled by lagged assets, to derive the percentage effect on pre-tax earnings of the median firm in the sample.

do not find such a significant relationship. The finding of insignificant effect for audit committee size in this study is consistent with Bedard *et al*. (2004) and Xie *et al*. (2003), but is in contrast to Yang and Krishnan (2005) who report that audit committee size is negatively associated with abnormal accrual. With regards to audit committee diligence, the finding of this study is consistent with Bédard *et al.* (2004) and Yang and Krishnan (2005) who also fail to find such an association, as opposed to other studies which reported negative association between earnings management and the number of audit committee meetings (Lin *et al*., 2006; Xie *et al*., 2003; Vafeas, 2005; Koh *et al*., 2007; Kent *et al*., 2010). The insignificant results for *BODFEM, BODFOREIGN, INTAUD, ACSIZE, ACINDP* and *ACMEET* imply that the role of corporate governance in the U.K. public listed firms is only ceremonial in nature, given that the variation between these characteristics among the companies does not contribute to improved quality of financial reporting. This conclusion is consistent with the proposition under institutional theory where companies are assumed to conform to its environmental pressure (to meet the requirement of the corporate governance best practices (e.g. Combined Code, 2008; U.K. Corporate Governance Code, 2010) simply to maintain its legitimacy, instead of intended to achieve an effective governance and monitoring role, particularly in the financial reporting process.

In addition to that, *ACFINEXP* is found to be positive and weakly significant ($p<0.10$) across all of the three models, suggesting that a higher proportion of audit committees with accounting or financial knowledge and experience contribute to higher discretionary accruals manipulation. This finding contradicts prior evidence of the positive impact of accounting financial expertise in deterring earnings management (Krishnan and Visvanathan, 2008; Xie *et al*., 2003; Bedard *et al*., 2004; Dhaliwal *et al*., 2010). The finding on *ACFINEXP* is contrary to the agency theory and stewardship theory propositions, where the board and audit committee is expected to provide stewardship to shareholders to safeguard their interest. Instead, the finding supports the managerial hegemony theory assertion that board decision and action is dominated by management pursuit of their self-serving interest. This interesting finding in respect of the corporate governance effectiveness during the sample period 2008 to 2011 could be argued to be partly motivated by the economic and financial conditions during the financial crisis when companies were facing a difficult time trying to maintain and improve their performance in the public equity market. Consistently, research on financial crises (e.g. the Asian financial crisis and the 2007/2008 financial crisis) has shown that there are various factors that motivate managers to engage in earnings management during the financial crisis period (e.g. Charoenwong and Jiraporn, 2008; Lang and Maffett, 2011; Habib *et al*., 2013), and accruals manipulation is one of the tools that could be used by management to stabilise earnings of current and consecutive periods. Taken together, it seems that the ineffective monitoring role of corporate governance in constraining accruals manipulation has been moderated by the presence of industry specialist auditors.

All control variables are significant at $p<0.10$ in the predicted directions in most of the model estimations, except for *TA*, *GROWTH*, *LOSS*, *ALTMAN*, *BLOCKOWN* and *BIG4* which are not significant at any conventional levels. Consistent with Reichelt and Wang (2010), Minutti-Meza (2013), and Francis *et al*. (2013), discretionary accruals are larger for firms with higher prior year total accruals (*PYTAC*), lower leverage (*DE*), lower operating cash flow (*CFO*) and higher growth opportunities (*MB*). Also, consistent with Reichelt and Wang (2010) and Minutti-Meza (2013), discretionary accruals are lower for clients audited by second tier audit firms (*SECOND*). Interestingly, in contrast to the U.S., based on this study's findings, the U.K. evidence suggests that it is actually the industry specialists within the Big 4 audit firms that play an important role in constraining accrual-based earnings management as compared to the Big 4 non-industry leaders. This finding supports the contention that the extensive industry-specific experience of the industry specialist auditors (Gramling and Stone, 2001) allows them to identify and address industry specific problems and issues more thoroughly than auditors who do not have that domain-specific knowledge (Craswell and Taylor, 1991; Eichenseher and Danos, 1981), resulting in differentially higher quality audits delivered to their clients.

The insignificant effect of *BLOCKOWN* contradicts the study's expectation that concentrated ownership should reduce the need of monitoring managerial behaviour, but is consistent with prior U.K. study by Peasnell (2005) as well as other studies in the U.S. by Davidson *et al*. (2005) and Sánchez-Ballesta and García-Meca (2007) who do not find any significant relationship between blockholder ownership and earnings management. This insignificant finding could be explained by the meta-analysis study by Hamid *et al*. (2014) on corporate governance and earnings management which reported that only ownership before the global financial crisis played a significant role in restricting earnings management, whereas ownership after the crisis has shown insignificant results. As this current study is based on the financial crisis period, the current findings may thus indicate that the financial crisis may have resulted in more vigilance and have brought about a more regulatory environment, therefore making ownership structure irrelevant to earnings management practices.

Table 10.1: *DAC_PERF* Regression under firm national-city framework

		Model 1				Model 2				Model 3			
Variables	**+/-**	**coef.**	**t-stat**	**p-value**		**coef.**	**t-stat**	**p-value**		**coef.**	**t-stat**	**p-value**	
Intercept		0.103	1.720	0.043	**	0.109	1.820	0.034	**	0.101	1.680	0.047	**
TA	+	0.001	0.190	0.426		0.001	0.120	0.454		0.002	0.240	0.407	
PYTAC	+	0.024	1.490	0.068	*	0.023	1.440	0.075	*	0.023	1.470	0.071	*
DE	-	-0.059	-2.140	0.016	**	-0.057	-2.090	0.019	**	-0.058	-2.090	0.019	**
GROWTH	+	0.003	0.520	0.301		0.003	0.510	0.306		0.003	0.510	0.305	
MB	+	0.002	1.460	0.073	*	0.002	1.510	0.066	*	0.002	1.480	0.070	*
CFO	-	-0.179	-2.930	0.002	***	-0.179	-2.930	0.002	***	-0.180	-2.940	0.002	***
LOSS	+	0.005	0.260	0.399		0.004	0.220	0.413		0.005	0.250	0.400	
ALTMAN	-	-0.003	-0.480	0.316		-0.003	-0.460	0.324		-0.003	-0.450	0.326	
BLOCKOWN	+	-0.003	-0.490	0.313		-0.003	-0.510	0.305		-0.003	-0.530	0.300	
BIG4	-	-0.015	-0.750	0.227		-0.023	-1.220	0.111		-0.013	-0.670	0.251	
SECOND	-	-0.043	-2.180	0.015	**	-0.043	-2.180	0.015	**	-0.043	-2.180	0.015	**
Industry Specialist Auditor													
NAT#2 (n=571)		-0.024	-2.510	0.012 0.006	**								
CITY#1 (n=401)						-0.016	-1.950	0.052	*				
JOINT_NAT#2-CITY#1 (n=337)										-0.030	-2.720	0.007	***
CITY#1_ONLY (n=64)										-0.008	-0.440	0.658	
NAT#2_ONLY (n=234)										-0.021	-1.740	0.082	*
Corporate Governance													
BODFEM		0.004	0.820	0.414		0.003	0.690	0.492		0.004	0.810	0.419	
BODFOREIGN		0.009	1.360	0.173		0.008	1.310	0.190		0.009	1.370	0.171	
INTAUD		-0.012	-1.100	0.272		-0.012	-1.170	0.243		-0.012	-1.140	0.256	
ACSIZE		-0.005	-1.020	0.307		-0.005	-0.940	0.346		-0.005	-1.020	0.308	
ACINDP		-0.002	-0.170	0.862		-0.001	-0.170	0.869		-0.001	-0.160	0.873	
ACFINEXP		0.008	1.830	0.068	*	0.008	1.720	0.085	*	0.008	1.850	0.065	*
ACMEET		-0.006	-0.890	0.376		-0.005	-0.820	0.411		-0.006	-0.900	0.369	
Year fixed-effects			Included				Included				Included		
Industry fixed-effects			Included				Included				Included		
R^2			0.214				0.212				0.214		
N			1347				1347				1347		

*** are significant at p<0.01, ** are significant at p<0.05 and *at p<0.10. All p-values are one-tailed, except for the industry specialist auditor variables and the corporate governance variables, which are two-tailed. Industry fixed-effects and year fixed-effects are not reported for brevity, and t-statistics and significance levels are calculated using the White (1980) robust standard errors to correct for heteroscedasticity. Refer Table 5.8 for definition of variables.

For robustness purposes, the study also examines the effect of industry specialist auditors and corporate governance on income-increasing (*DAC_PERF* ≥ 0) and income-decreasing discretionary accruals (*DAC_PERF* < 0). Table 10.2 Panel A below reports the estimation results where the dependent variable is the income-increasing discretionary accruals, whereas Panel B reports the estimation results where the dependent variable is the income-decreasing abnormal accruals. Examining Table 10.2 Panel A, all models are significant ($p<0.01$), and the adjusted R^2 ranges from 29.3 percent to 30.2 percent. The results for Model 1, Model 2 and Model 3 are consistent with those reported in Table 10.1. Based on Model 3, which is the model of interest, the coefficients of *JOINT_NAT#2-CITY#1* and *NAT#2_ONLY* are negative and significant (coefficient = -0.050, $p<0.05$ and coefficient = -0.050, $p<0.05$, respectively). However, the coefficient on *CITY#1_ONLY* is not significant at any conventional level. These results indicate that clients of audit firms who are both national and city-specific industry specialists as well as an industry leader alone have lower income-increasing discretionary accruals. An *F*-test indicates there is no significant difference between the coefficients for the joint national and city-specific industry leaders and the national leader alone (*F*-statistic=0.000, p=0.986). This finding suggests that earnings quality is higher (smaller income-increasing discretionary accruals) when the audit firm is a national industry leader, either alone or in conjunction with city industry leadership. In other words, audit firm national industry leadership is an important condition to reduce income-increasing accrual-based earnings management.

On the other hand, examining Table 10.2, Panel B, all models are significant ($p < 0.01$) and the adjusted R^2 are around 20.7 percent. Interestingly, none of the industry specialist auditor variables across all the three model estimations are significant, indicating industry specialist auditors at the firm level do not play an important role in restraining income-decreasing abnormal accruals. Perhaps income-decreasing accruals may not be an important issue that needs to cause concern for an audit firm, but audit firms are particularly interested in their clients' practices of income-increasing discretionary accruals that can potentially lead to heavily manipulated or distorted earnings. Overall, it seems that only the results for the income-increasing discretionary accruals corroborate the earlier findings using the magnitude of overall discretionary accruals reported in Table 10.1. Therefore, this shows that audit firms with leading industry expertise are more concerned about income-increasing earnings management than income-decreasing earnings management. However, this finding is in contrast to a previous study by Reichelt and Wang (2010) which found that clients report smaller income-increasing abnormal accruals and smaller income-decreasing accruals when the auditor is both a national and a city industry specialist.

In addition, when comparing the corporate governance results between Panel A and Panel B in Table 10.2 below, it can be seen that corporate governance only plays an effective role in reducing income-increasing discretionary accruals. The coefficients for *ACSIZE* and *ACMEET* are significantly negative

Table 10.2: Income-increasing and income-decreasing *DAC_PERF* Regression under firm national-city framework

		Panel A: Income-increasing discretionary accruals									Panel B: Income-decreasing discretionary accruals								
		Model 1			Model 2			Model 3			Model 1			Model 2			Model 3		
Variables	**+/-**	**coef.**	**t-stat**	**sig.**	**coef.**	**t-stat**	**sig.**	**coef.**	**t-stat**	**sig.**	**coef.**	**t-stat**	**sig.**	**coef.**	**t-stat**	**sig.**	**coef.**	**t-stat**	**sig.**
Intercept		-0.057	-0.760	0.225	-0.054	-0.710	0.239	-0.056	-0.740	0.229	0.218	2.450	0.007**	0.220	2.490	0.007**	0.215	2.400	0.009**
TA	+	0.017	1.630	0.052*	0.016	1.580	0.058*	0.016	1.610	0.054*	-0.008	-0.640	0.262	-0.008	-0.660	0.255	-0.007	-0.600	0.275
PYTAC	+	0.045	1.900	0.029**	0.044	1.850	0.033**	0.045	1.890	0.030**	0.000	0.020	0.494	0.000	0.000	0.500	0.000	0.010	0.496
DE	-	-0.060	-1.240	0.108	-0.061	-1.250	0.106	-0.058	-1.220	0.112	-0.068	-2.030	0.022**	-0.067	-2.000	0.023**	-0.069	-2.010	0.023**
GROWTH	+	0.001	0.090	0.464	0.000	-0.060	0.476	0.001	0.080	0.468	0.008	0.880	0.190	0.008	0.900	0.186	0.008	0.880	0.191
MB	+	0.000	0.170	0.432	0.001	0.320	0.376	0.000	0.150	0.439	0.003	1.640	0.051*	0.003	1.650	0.050*	0.003	1.660	0.049**
CFO	-	-0.209	-3.300	0.001***	-0.215	-3.390	0.001**	-0.210	-3.310	0.001**	-0.183	-1.660	0.049**	-0.182	-1.660	0.049**	-0.184	-1.660	0.048**
LOSS	+	-0.020	-0.820	0.208	-0.020	-0.840	0.202	-0.019	-0.800	0.213	0.011	0.360	0.361	0.011	0.350	0.365	0.011	0.360	0.361
ALTMAN	-	0.002	0.150	0.440	0.002	0.150	0.440	0.002	0.140	0.443	-0.005	-0.610	0.270	-0.005	-0.590	0.278	-0.005	-0.580	0.281
BLOCKOWN	+	-0.011	-1.660	0.049**	-0.010	-1.530	0.063*	-0.011	-1.640	0.051*	0.003	0.300	0.383	0.002	0.260	0.397	0.002	0.270	0.395
BIG4	-	0.016	0.610	0.272	-0.005	-0.190	0.426	0.020	0.690	0.246	-0.048	-1.630	0.052*	-0.051	-1.740	0.042**	-0.048	-1.660	0.049**
SECOND	-	-0.021	-1.060	0.144	-0.021	-1.080	0.140	-0.021	-1.060	0.146	-0.064	-1.990	0.024**	-0.064	-1.990	0.024**	-0.064	-1.980	0.024**
<u>*Industry Specialist Auditor*</u>																			
NAT#2		-0.047	-2.640	0.009***							-0.011	-0.940	0.350						
CITY#1					-0.021	-1.550	0.121							-0.009	-0.860	0.391			
JOINT_NAT#2-CITY#1								-0.050	-2.520	0.012**							-0.015	-1.110	0.269
CITY#1_ONLY								-0.016	-0.500	0.615							0.002	0.060	0.951
NAT#2_ONLY								-0.050	-2.150	0.032**							-0.005	-0.390	0.699
<u>*Corporate Governance*</u>																			
BODFEM		0.007	0.960	0.336	0.005	0.680	0.498	0.007	0.970	0.333	0.001	0.180	0.858	0.001	0.160	0.876	0.001	0.190	0.850
BODFOREIGN		0.005	0.540	0.590	0.003	0.360	0.722	0.005	0.510	0.610	0.010	1.120	0.262	0.010	1.130	0.258	0.010	1.170	0.244
INTAUD		-0.015	-1.040	0.297	-0.016	-1.110	0.265	-0.015	-1.050	0.296	-0.003	-0.170	0.864	-0.003	-0.200	0.839	-0.003	-0.190	0.850
ACSIZE		-0.015	-2.260	0.024**	-0.013	-2.040	0.042**	-0.015	-2.250	0.025**	0.000	0.060	0.955	0.000	0.050	0.959	0.001	0.060	0.949
ACINDP		0.009	0.960	0.338	0.010	1.030	0.303	0.009	0.930	0.353	-0.009	-0.670	0.501	-0.009	-0.670	0.502	-0.009	-0.660	0.507
ACFINEXP		0.014	1.910	0.057*	0.012	1.740	0.083*	0.014	1.890	0.059*	0.002	0.400	0.690	0.002	0.390	0.696	0.003	0.450	0.651
ACMEET		-0.019	-1.900	0.058*	-0.018	-1.810	0.071*	-0.019	-1.900	0.058*	0.004	0.430	0.664	0.004	0.450	0.656	0.004	0.420	0.675
Year fixed-effects			Included			Included			Included			Included			Included			Included	
Industry fixed-effects			Included			Included			Included			Included			Included			Included	
R^2			0.301			0.293			0.302			0.207			0.207			0.207	
N			551			551			551			796			796			796	

*** are significant at p<0.01, ** are significant at p<0.05 and *at p<0.10. All p-values are one-tailed, except for the industry specialist auditor variables and corporate governance variables which are two-tailed. Industry fixed-effects and year fixed-effects are not reported for brevity, and t-statistics and significance levels are calculated using the White (1980) robust standard errors to correct for heteroscedasticity. Refer Table 5.8 for definition of variables.

at $p<0.05$ and $p<0.10$, respectively, across all of the three model estimations. This finding indicates that *ACSIZE* and *ACMEET* only focus on restraining income-increasing accruals instead of the magnitude of accruals, which explains why these variables are insignificant as outlined in Table 10.1. Nevertheless, consistent with earlier findings in Table 10.1 for the *DAC_PERF* analysis, *ACFINEXP* continues to be positive and significant, supporting the notion that more accounting or financial expert members in the audit committee contribute to higher discretionary accruals manipulation activities.

On the other hand, none of the corporate governance variables in Panel B are significant, suggesting that corporate governance characteristics of the client do not play an important role in restraining income-decreasing discretionary accruals, perhaps again because income-decreasing discretionary accruals may not be regarded as of great consequence as income-increasing discretionary accruals to the efficient operation of capital markets.

10.2.1.2 Accruals estimation error (*AEE*)

The analysis in this section of the chapter regresses the various industry specialists and corporate governance proxies on the accrual quality measure introduced by McNichols (2002). McNichols (2002) has modified the Dechow and Dichev (2002) model and the Jones (1991) earnings management model by including the change in revenue and property, plant, and equipment as additional control variables in determining residuals. The residuals from the modified regression represent the accrual estimation error, which is an inverse measure of accruals quality. According to Francis *et al*. (2005), discretionary accruals quality is attributable to managers' estimates and accounting implementation decisions and is priced by investors' more than discretionary accruals and other proxies for accruals quality. Thus, this measure as developed by McNichols (2002) is included in the analysis of this section.

The adjusted R^2 for all models in Table 10.3 below is between 11.4 percent and 11.6 per cent and is significant ($p<0.01$), suggesting that the models are statistically valid. These values, although low, are comparable with the prior research conducted by Srinidhi *et al*. (2011) in this area using the same measure of accruals, which reported an R^2 of 11.5 percent.

Model 1 tests the effect of the Big 4 firm national industry leadership and corporate governance in reducing accruals estimation error (*AEE*). The same iterative process used in previous analyses results in only the nationally top-ranked Big 4 firm having a significant coefficient, but not for the second-ranked leader as, when the second ranked auditor indicator variable is tested, it is not significant at any conventional level. Thus, the results for Model 1 reported in Table 10.3 use a single auditor indicator variable that takes on the value of 1 if a Big 4 audit firm is the top-ranked nationally (*NAT#1*) and tests the effect of national-level industry leadership *per se* in reducing *AEE* for 289 observations in which the Big 4 auditor is the national industry leader, and the default comparison group is all of the remaining 794 observations not having Big 4 national industry leaders. The *NAT#1* coefficient value is

-0.018 and is significant at $p<0.10$. This finding is consistent with the earlier finding using the Kothari *et al*. (2005) performance-matched discretionary accruals models presented in Table 10.1 and Table 10.2, suggesting that audit firm national industry leadership contributes to higher accruals quality by reducing accrual estimation error.

Model 2 tests the effect of the firm city industry leadership and corporate governance in reducing the magnitude of *AEE* on the company's reported profit. Interestingly, the results from the iterative process indicate that even the coefficient for the top-ranked firm is not significant at any conventional level. Thus, the regression for Model 2 reported in Table 10.3 below uses a single auditor indicator variable that takes on the value of 1 if an audit firm is the top-ranked firm in a city-specific industry (*CITY#1*), and tests the effect of city-level industry leadership on the Big 4 ability to reduce *AEE* for 363 observations in which the Big 4 auditor is the city industry leader, and the default comparison group is all of the remaining 720 observations not having Big 4 city industry leaders. The coefficient for *CITY#1* is not significant at any conventional level. This finding under *AEE* analysis for firm city industry leadership is inconsistent with the *DAC_PERF* results reported in Table 10.1 earlier, as well as with findings from prior studies (Sun and Liu, 2013; Choi *et al*., 2010; Reichelt and Wang, 2010; Cahan *et al*., 2011; Minutti-Meza, 2013) which have documented that lower discretionary accruals are reported by clients of audit firms which are city industry leaders. This suggests that unlike the audit firm national industry leadership, the finding for audit firm city industry leadership is not robust to alternative measures of accrual-based earnings management.

Model 3 is the primary model of interest because it controls explicitly for the joint effect of national and city-specific industry leadership through the use of three auditor indicator variables. The first auditor indicator variable is coded 1 for 251 observations (23 percent of sample) in which the audit firm is both the top-ranked national leader and top-ranked city-specific industry leader (*JOINT_NAT#1-CITY#1*); the second auditor indicator variable is coded 1 for 112 observations (10 percent of sample) in which the audit firm is the top-ranked city-specific industry leader but not the top-ranked national leader (*CITY#1_ONLY*); and the third auditor indicator variable is coded 1 for 38 observations (4 percent of sample) in which the auditor is the top-ranked national industry leader but not the top-ranked city-specific industry leader (*NAT#1_ONLY*). In other words, companies with auditors that are national industry leaders (N=289) can be decomposed into those audited by national leaders alone (N=38), plus those whose auditors are joint national and city-specific industry leaders (N=251). Similarly, companies with auditors that are city-specific industry leaders (N=363) can be decomposed into those audited by city-specific industry leaders alone (N=112), plus those auditors that are jointly national and city-specific industry leaders (*N*=251). The purpose of these three partitions is to test for the separate effects of national and city-specific industry leadership, as well as to isolate the joint effect of national and city-specific industry leadership on the magnitude of the *AEE*. The default comparison group is the 682 observations (63 percent of sample) in which the auditor is neither the top-ranked national nor top-ranked city-industry leader.

Results of Model 3 in Table 10.3 below show that neither national industry leadership alone or city-specific industry leadership alone reduces the magnitude of the accrual estimation error (*AEE*), as coefficients for *CITY#1_ONLY* and *NAT#1_ONLY* are not significant at any conventional level. Instead, only the coefficient *JOINT_NAT#1-CITY#1* for joint national and city-specific industry leadership is negative and significant (coefficient = -0.020, p<.0.10). This finding suggests smaller *AEE* and higher earnings quality are achieved when the audit firm is an industry leader at both the national and city level concurrently. This finding is consistent with Minutti-Meza (2013), but is in contrast to Choi *et al*. (2010) who have documented that the effect of office-level industry expertise dominates the effect of national-level industry expertise in deterring management opportunistic earnings manipulation. On the other hand, the study by Reichelt and Wang (2010) has reported significant effect for both the joint national-city specialist as well as for firms which are city specialists only.

The coefficient for the joint national-city industry leaders in Model 3 is -0.020, as noted in the preceding paragraph. The magnitude of this coefficient is 200 percent of pre-tax earnings, based on mean pre-tax earnings (scaled by lagged assets) of 0.01 in the sample[23]. In other words, a client of an audit firm which is a joint national and city industry leaders enjoy the benefit of two times lesser *AEE* relative to companies not audited by an audit firm which is a joint national and city industry specialist. This evidence strongly suggests that the U.K. sterling pound impact of smaller *AEE* has a material effect on earnings using the standard five percent rule-of-thumb, and the earnings per share effect may be even more important where even one pence per share matters. Thus, it can be concluded that the impact of joint national-city audit firm industry leadership in reducing *AEE* is statistically and economically significant.

Interestingly, none of the corporate governance variables examined are significant at any conventional level, except *ACINDP* which is weakly significant in Model 3 (coefficient=0.012. p<0.10). Consistent with the results in Table 10.1, all control variables are significant at p<0.10 in the predicted directions in most of the model estimations, except for *TA, PYTAC, DE, GROWTH, MB, BLOCKOWN* and *BIG4* which are not significant. In addition, *LOSS* and *ALTMAN* are also insignificant. This supports prior

[23] Coefficients on the auditor indicator variables measure the average change (due to the auditor variable) in the dependent variable which is the absolute value of discretionary accruals scaled by lagged assets. Following Reichelt and Wang (2010), the magnitude is computed by dividing each coefficient on the auditor indicator variables by the absolute value of mean pre-tax earnings in the sample, also scaled by lagged assets, to derive the percentage effect on pre-tax earnings of the median firm in the sample.

Table 10.3: *AEE* Regression under firm national-city framework

		Model 1				Model 2				Model 3			
Variables	**+/-**	**coef.**	**t-stat**	**p-value**	**sig.**	**coef.**	**t-stat**	**p-value**	**sig.**	**coef.**	**t-stat**	**p-value**	**sig.**
Intercept		0.138	2.050	0.020	**	0.146	2.220	0.014	**	0.135	2.020	0.022	**
TA	+	0.002	0.220	0.414		0.001	0.100	0.459		0.002	0.250	0.400	
PYTAC	+	-0.003	-0.270	0.393		-0.003	-0.250	0.400		-0.003	-0.290	0.388	
DE	-	-0.039	-1.050	0.147		-0.035	-0.980	0.165		-0.040	-1.070	0.142	
GROWTH	+	0.008	0.810	0.209		0.008	0.800	0.213		0.008	0.810	0.209	
MB	+	0.000	0.420	0.339		0.000	0.400	0.346		0.000	0.430	0.335	
CFO	-	-0.048	-1.680	0.047	**	-0.050	-1.700	0.045	**	-0.048	-1.640	0.051	*
LOSS	+	0.023	1.810	0.035	**	0.023	1.800	0.036	**	0.024	1.850	0.033	**
ALTMAN	-	-0.013	-2.750	0.003	***	-0.013	-2.810	0.003	***	-0.013	-2.770	0.003	***
BLOCKOWN	+	0.003	0.770	0.221		0.003	0.790	0.214		0.003	0.710	0.238	
BIG4	-	0.001	0.060	0.477		0.001	0.040	0.485		-0.001	-0.030	0.487	
SECOND	-	-0.024	-1.570	0.059	*	-0.024	-1.560	0.059	*	-0.024	-1.580	0.058	*
Industry Specialist Auditor													
NAT#1 (n=289)		-0.018	-1.860	0.063	*								
CITY#1 (n=363)						-0.012	-1.140	0.253					
JOINT_NAT#1-										-0.020	-1.810	0.070	*
CITY#1_ONLY (n=112)										0.003	0.170	0.865	
NAT#1_ONLY (n=38)										-0.004	-0.300	0.763	
Corporate Governance													
BODFEM		0.007	1.290	0.198		0.007	1.320	0.188		0.007	1.330	0.185	
BODFOREIGN		0.003	0.500	0.619		0.002	0.380	0.705		0.003	0.540	0.587	
INTAUD		-0.014	-1.220	0.223		-0.013	-1.210	0.226		-0.013	-1.180	0.240	
ACSIZE		0.003	0.430	0.664		0.003	0.390	0.698		0.003	0.450	0.652	
ACINDP		0.012	1.610	0.108		0.012	1.590	0.112		0.012	1.670	0.095	*
ACFINEXP		-0.003	-0.650	0.516		-0.003	-0.670	0.506		-0.003	-0.630	0.528	
ACMEET		-0.008	-0.760	0.446		-0.007	-0.700	0.484		-0.008	-0.760	0.447	
Year fixed-effects		Included				Included				Included			
Industry fixed-effects		Included				Included				Included			
R^2		0.115				0.114				0.116			
N		1,083				1,083				1,083			

*** are significant at p<0.01, ** are significant at p<0.05 and *at p<0.10. All p-values are one-tailed, except for the industry specialist auditor variables and corporate governance variables which are two-tailed. Industry fixed-effects and year fixed-effects are not reported for brevity, and t-statistics and significance levels are calculated using the White (1980) robust standard errors to correct for heteroscedasticity. Refer Table 5.8 for definition of variables.

findings (Reichelt and Wang, 2010) which report that *AEE* are larger for companies with higher bankruptcy risk (*ALTMAN*)[24] and are smaller for firms which have reported losses in the past three years (*LOSS*).

10.2.1.3 Likelihood to report a profit / (avoid a loss) (*PROFIT*)

Next, a probit model is used to examine the likelihood of companies audited by Big 4 industry specialist auditors and with effective corporate governance in reporting a loss rather than a profit. Managers of firms prefer to avoid losses (Graham *et al*. 2005), and for this model the dependent variable *PROFIT* is coded 1 for firms that report a bottom-line positive net income and zero for loss firms. Following Francis *et al*. (2013), *PROFIT* is coded as 1 to be consistent with the directional prediction for accruals, as a higher-quality audit is expected to result in a lower likelihood of managers reporting a profit (i.e., reporting more losses), just as high-quality audits are expected to result in smaller accruals. The adjusted R^2 for all models in Table 10.4 below are between 35.8 percent and 36.2 percent and all are significant ($p<0.01$), suggesting that the models are statistically valid, though slightly lower as compared to the regression model used by Francis *et al*. (2013) in their cross-country study with R^2 of 45.5 percent.

Model 1 tests the effect of the likelihood of the Big 4 firm national industry leadership and the corporate governance function to report a profit instead of a loss relative to other non-Big 4 industry leaders. Results of the same iterative process used in previous analyses indicate that the top three audit firms are industry leaders at the national level, as the top three Big 4 firms ranked nationally have a significant coefficient relative to the remaining Big 4 firms who are non-industry leaders. When the fourth-ranked auditor indicator variable is tested, it is not significant at any conventional level. The coefficient for the top-ranked is -0.424 ($p<0.01$), for the second-ranked is -0.390 ($p<0.05$) and for the third-ranked is -0.289 ($p<0.10$). Thus, the results for Model 1 reported in Table 10.4 below use a single auditor indicator variable that takes on the value of 1 if an audit firm is among the top three ranked firms in an industry (*NAT#3*) and tests the effect of national-level industry leadership per se on differential Big 4 ability to report a profit rather than a loss for 733 observations in which the Big 4 auditor is the national industry leader, and the default comparison group is all of the remaining 614 observations not having Big 4 national industry leaders. The *NAT#3* coefficient value is -0.378 and significant at $p<0.05$. Model 2 tests the effect of the likelihood of the Big 4 firm city industry leadership and the corporate governance function to report a profit instead of a loss, relative to other non-Big 4 city-specific industry leaders. Interestingly, the results from the iterative process indicate that even the coefficient for the top-ranked firm is not significant at any conventional level. Thus, the results for Model 2 reported in Table 10.4 use a single auditor indicator variable that takes on the value of 1 if an audit firm is the top-ranked firm in a city-industry level (*CITY#1*), and tests the effect of city-level industry leadership per se on differential Big 4 likelihood to report a profit or avoid a loss

[24] The Altman score measures the likelihood of a company survival. Lower (higher) scores measure greater (lesser) bankruptcy risk. We expect a negative association between accrual estimation error and the company's Altman Z-score.

for 401 observations in which the Big 4 auditor is the city-specific industry leader, and the default comparison group is all of the remaining 946 observations not having Big 4 city industry leaders. The coefficient for *CITY#1* is -0.150 and is insignificant at *p*=0.10.

The findings from Model 1 suggest that clients of audit firms which are one of the top three national industry leaders have got a higher likelihood of reporting a loss instead of profit, but not for clients of the top-ranked Big 4 city industry leaders. However, when the effect of both national and city industry leadership is controlled for in Model 3, results indicate that only the audit firm which is the joint national and city-specific industry leader *JOINT_NAT#3-CITY#1* is more conservative in their clients' profit reporting; however, this is not the case for audit firms which only hold either a national industry leadership position (*NAT#3_ONLY*) or a city industry leadership position (*CITY#1_ONLY*). The coefficient for *JOINT_NAT#3-CITY#1* (coefficient = -0384) is significant at *p*<0.05.

Interestingly, none of the corporate governance variables are significant at any conventional level, suggesting that the variation on the company's corporate governance characteristics do not have a significant effect on the company's likelihood of reporting profit (or loss). Control variables *TAC*, *MB*, *CFO*, *LAG_LOSS* and *ALTMAN* are significant and in the predicted direction, suggesting that companies that have lower accruals, higher growth opportunities, and lower operating cash flows do not experience loss in the prior year, have a higher risk of bankruptcy and are more likely to report a profit rather than a loss (consistent with Francis *et al*., 2013). Interestingly, *BIG4* and *SECOND* are also positive and significant, suggesting that clients of Big 4 (non-specialist) firms and second-tier firms are more likely to report a profit rather than a loss. This suggests that Big 4 audit firms which are joint national and city-specific industry leaders are more conservative in the profit reporting relative to Big 4 and second-tier audit firms.

Overall, the results of the earnings management analysis under the Big 4 audit firm national-city framework for auditor industry specialisation while controlling for the effect of corporate governance suggest consistent evidence that only the audit firm which is both a national and city-specific industry leader is able to effectively provide higher earnings quality. This is based on the evidence of lower discretionary accrual, lower accrual estimation error (*AEE*) and also lower likelihood of reporting a profit (*PROFIT*). This finding is consistent with the evidence of fee premium documented earlier in Chapter 7, which is only earned by the Big 4 audit firms with industry leadership at both the national and city level.

Table 10.4: *PROFIT* Regression under firm national-city framework

		Model 1				Model 2				Model 3			
Variables	**+/-**	**coef.**	**t-stat**	**p-value**	**sig.**	**coef.**	**t-stat**	**p-value**	**sig.**	**coef.**	**t-stat**	**p-value**	**sig.**
Intercept		-0.349	-0.530	0.300		-0.323	-0.490	0.314		-0.369	-0.550	0.290	
LTA	+	0.097	1.130	0.129		0.095	1.110	0.134		0.102	1.190	0.117	
DE	-	-0.030	-0.080	0.466		-0.047	-0.130	0.447		-0.028	-0.080	0.469	
TAC	-	-1.886	-3.900	0.000	***	-1.838	-3.710	0.000	***	-1.900	-3.880	0.000	***
GROWTH	+	0.071	1.090	0.137		0.065	1.010	0.156		0.071	1.100	0.137	
MB	+	0.020	1.650	0.049	**	0.019	1.610	0.054	*	0.020	1.720	0.043	**
CFO	-	2.412	4.520	0.000	***	2.391	4.530	0.000	***	2.394	4.470	0.000	***
LAG_LOSS	-	-0.775	-7.570	0.000	***	-0.782	-7.620	0.000	***	-0.780	-7.590	0.000	***
ALTMAN	-	0.176	2.460	0.007	***	0.175	2.440	0.008	***	0.175	2.440	0.008	***
BLOCKOWN	+	-0.009	-0.180	0.428		-0.008	-0.160	0.437		-0.012	-0.250	0.403	
BIG4	-	0.332	1.770	0.039	**	0.086	0.600	0.275		0.261	1.310	0.095	*
SECOND	-	0.194	1.380	0.084	*	0.193	1.370	0.086	*	0.193	1.370	0.085	*
<u>*Industry Specialist Auditor*</u>													
NAT#3(n=733)		-0.378	-2.420	0.016	**								
CITY#1 (n=401)						-0.150	-1.380	0.167					
JOINT_NAT#3-CITY#1 (n=374)										-0.384	-2.120	0.034	**
CITY#1_ONLY (n=27)										0.486	1.140	0.253	
NAT#3_ONLY (n=359)										-0.234	-1.320	0.187	
<u>*Corporate Governance*</u>													
BODFEM		0.000	0.000	1.000		0.004	0.060	0.950		0.006	0.100	0.921	
BODFOREIGN		-0.065	-1.090	0.275		-0.068	-1.150	0.252		-0.057	-0.950	0.340	
INTAUD		0.176	1.420	0.155		0.170	1.380	0.168		0.172	1.390	0.165	
ACSIZE		0.051	0.820	0.411		0.051	0.830	0.408		0.045	0.730	0.467	
ACINDP		0.001	0.010	0.995		0.004	0.050	0.960		0.013	0.170	0.868	
ACFINEXP		0.013	0.270	0.787		0.010	0.200	0.844		0.013	0.270	0.783	
ACMEET		0.005	0.080	0.939		0.008	0.130	0.893		0.005	0.090	0.929	
Year fixed-effects		Included				Included				Included			
Industry fixed-effects		Included				Included				Included			
R^2		0.360				0.358				0.362			
N		1,347				1,347				1,347			

*** are significant at p<0.01, ** are significant at p<0.05 and *at p<0.10. All p-values are one-tailed, except for the industry specialist auditor variables and corporate governance variables which are two-tailed. Industry fixed-effects and year fixed-effects are not reported for brevity, and t-statistics and significance levels are calculated using the White (1980) robust standard errors to correct for heteroscedasticity. Refer Table 5.8 for definition of variables.

10.2.2 Partner national-city framework

Next, the same earnings management analyses under the previous firm national-city framework are re-performed using the partner national-city framework. Table 10.5, Table 10.6 and Table 10.7 below present the results based on the three different measures of earnings quality as applied in the preceding sections of this chapter: discretionary accruals models (*DAC_PERF*), accrual estimation error (*AEE*) and the likelihood of reporting profit (*PROFIT*) under the partner national-city framework.

10.2.2.1 Performance-matched discretionary accrual (*DAC_PERF*)

This section demonstrates the effect of audit partner industry specialism and corporate governance on discretionary accruals, based on the Kothari *et al*. (2005) performance-matched discretionary accrual model. As compared to the firm national-city framework, the size of the model dropped by 328 after excluding the year 2008 observations which do not have available data on the audit partners. The analysis in this section focuses on both the magnitude of the discretionary accruals as well as the direction. Table 10.5 below presents the results examining the effect of industry specialist audit partner and corporate governance in reducing the magnitude of discretionary accruals, whereas Table 10.6 presents the results of the analysis examining the effect of industry specialist audit partner and corporate governance on both income-increasing and income-decreasing discretionary accruals.

All the models in Table 10.5 are significant at $p < 0.01$, and their adjusted R^2 is about 22.9 percent. The same iterative process as used in prior analysis has been used to determine the partner industry specialist auditor ranked at the national and city-industry level. Interestingly, based on the iterative process, neither the variable *PARNAT#1* (in Model 1) nor *PARCITY#1* (in Model 2) is significant at any conventional levels in Model 1 and Model 2, respectively, suggesting that audit partner industry expertise does not play an important role in reducing the magnitude of discretionary accruals. Thus, the results for Model 1 reported in Table 10.5 use a single auditor indicator variable that takes on the value of 1 if a Big 4 partner is the top-ranked industry leader nationally and tests the effect of partner national-level industry leadership *per se* on reducing the magnitude of discretionary accruals for 39 observations in which the top-ranked partners are the national industry leaders, and the default comparison group is all of the remaining 624 observations not having Big 4 national industry leaders. In comparison, the results for Model 2 reported in Table 10.5 use a single auditor indicator variable that takes on the value of 1 if a Big 4 partner is the top-ranked city industry leader and tests the effect of partner city level industry leadership per se on reducing the magnitude of discretionary accruals for 178 observations in which the top-ranked partners are the city industry leaders, and the default comparison group is all of the remaining 485 observations not having Big 4 city industry leaders.

Model 3 is the primary model of interest because it controls explicitly for the joint effect of partner national and city-specific industry leadership through the use of three audit partner indicator variables. The first audit partner indicator variable is coded 1 for 39 observations (4 percent of the sample) in which the partner is both the top-ranked national leader and top-ranked city-specific industry leader; the second auditor indicator variable is coded 1 for 139 observations (14 percent of the sample) in which the partner is the top-ranked city-specific industry leader but not the top national leader, whereas there is no observation available for the third auditor indicator variable which is coded 1 for when the auditor is the top national industry leader but not the top city-specific industry leader.

In other words, companies with partners that are national industry leaders (N=39) are also jointly city-specific industry leaders (N=39), with none of them being national industry leaders alone (N=0). Companies with partners that are city-specific industry leaders (N=401) can be decomposed into those audited by city-specific industry leaders alone (N=64), plus those partners that are jointly national and city-specific industry leaders (N=337). The purpose of these three partitions is to test for the separate effects of national and city-specific industry leadership on the magnitude of discretionary accruals, as well as to isolate the joint effect of partners national and city-specific industry leadership of the partners on the magnitude of discretionary accruals. The default comparison group is the 841 observations (82 percent of the sample) in which the audit partner is neither the top national nor top city industry leader. Interestingly, none of the audit partner indicator variables in Model 3 are significant; suggesting that audit partner industry leadership does not play an important role in constraining earnings management through reducing the discretionary accruals.

In respect of the corporate governance characteristics, all the variables are not significant at any conventional level, except for *ACFINEXP* which is significant at $p<0.10$. As reported in Table 10.2, the significant *ACFINEXP* is consistent under the firm national-city framework, suggesting that there is a higher risk of income-increasing accruals manipulation when the clients' audit committee is comprised of more members with accounting or financial expertise. In respect of the control variables, except for *PYTAC*, the coefficients of *DE*, *MB*, *CFO* and *SECOND* are significant in the expected direction, consistent with the earlier *DAC_PERF* results reported in the analysis in Table 10.1 using the audit firm national-city framework.

Table 10.5: *DAC_PERF* Regression under partner national-city framework

		Model 1				Model 2				Model 3			
Variables	**+/-**	**coef.**	**t-stat**	**p-value**	**sig.**	**coef.**	**t-stat**	**p-value**	**sig.**	**coef.**	**t-stat**	**p-value**	**sig.**
Intercept		0.125	1.580	0.057	*	0.134	1.780	0.038	**	0.127	1.620	0.053	*
TA	+	-0.003	-0.310	0.378		-0.005	-0.460	0.321		-0.004	-0.340	0.367	
PYTAC	+	0.024	1.060	0.144		0.024	1.070	0.143		0.024	1.070	0.144	
DE	-	-0.048	-1.450	0.073	*	-0.047	-1.430	0.077	*	-0.047	-1.440	0.076	*
GROWTH	+	-0.005	-0.580	0.280		-0.005	-0.570	0.284		-0.005	-0.580	0.281	
MB	+	0.002	1.310	0.095	*	0.002	1.280	0.100		0.002	1.310	0.095	*
CFO	-	-0.198	-2.680	0.004	***	-0.197	-2.670	0.004	***	-0.197	-2.670	0.004	***
LOSS	+	0.011	0.500	0.310		0.011	0.490	0.312		0.011	0.490	0.311	
ALTMAN	-	-0.002	-0.290	0.387		-0.002	-0.230	0.409		-0.002	-0.250	0.400	
BLOCKOWN	+	-0.002	-0.200	0.422		-0.002	-0.200	0.420		-0.002	-0.220	0.412	
BIG4	-	-0.028	-1.250	0.106		-0.025	-1.130	0.130		-0.026	-1.160	0.123	
SECOND	-	-0.044	-1.880	0.031	**	-0.044	-1.880	0.031	**	-0.044	-1.880	0.031	**
Industry Specialist Auditor													
PARNAT#1 (n=39)		-0.018	-1.220	0.224									
PARCITY# (n=178)						-0.009	-0.820	0.414					
PARJOINT_PARTNAT#1-PARCITY#1 (n=39)										-0.019	-1.270	0.203	
PARCITY_ONLY (n=139)										-0.006	-0.500	0.615	
PARTNAT#1_ONLY(n=0)													
Corporate Governance													
BODFEM		0.008	1.300	0.194		0.007	1.240	0.216		0.007	1.260	0.208	
BODFOREIGN		0.008	0.980	0.328		0.007	0.930	0.355		0.007	0.960	0.338	
INTAUD		-0.003	-0.240	0.810		-0.002	-0.160	0.876		-0.003	-0.210	0.835	
ACSIZE		-0.007	-1.090	0.278		-0.007	-1.110	0.265		-0.007	-1.090	0.276	
ACINDP		-0.003	-0.230	0.820		-0.002	-0.220	0.829		-0.003	-0.220	0.826	
ACFINEXP		0.011	1.980	0.048	**	0.011	1.960	0.050	**	0.011	1.980	0.048	**
ACMEET		-0.002	-0.320	0.747		-0.002	-0.320	0.747		-0.002	-0.330	0.743	
Year fixed-effects		Included				Included				Included			
Industry fixed-effects		Included				Included				Included			
R^2		0.229				0.229				0.229			
N		1,019				1,019				1,019			

*** are significant at p<0.01, ** are significant at p<0.05 and *at p<0.10. All p-values are one-tailed. Industry fixed-effects and year fixed-effects are not reported for brevity, and t-statistics and significance levels are calculated using the White (1980) robust standard errors to correct for heteroscedasticity. Refer Table 5.8 for definition of variables.

Next, the study also examines the effect of industry specialist audit partner and corporate governance on income-increasing (*DAC_PERF* ≥ 0) and income-decreasing discretionary accruals (*DAC_PERF* < 0). Table 10.6, Panel A, below reports the estimation results where the dependent variable is the income-increasing discretionary accruals, whereas Panel B reports the estimation results where the dependent variable is the income decreasing abnormal accruals. Examining Table 10.6, Panel A, all models are significant (p<0.01), and the adjusted R^2 ranges from 31.7 percent to 31.8 percent. The results for Model 1, Model 2 and Model 3 are consistent with those reported in Table 10.5 where none of the industry specialist audit partner variables are significant. This indicates that industry expertise of the audit partners does not play an important role in reducing income-increasing discretionary accruals.

On the other hand, examining Table 10.6, Panel B, all models are significant (p<0.01) and the adjusted R^2 is 23.6 percent. Interestingly, none of the industry specialist audit partner variables across all the three model estimations are significant. Results in Panel A and Panel B taken together corroborate the earlier findings using the magnitude of discretionary accruals reported in Table 10.5 above, and indicate that industry specialist auditors at the partner level do not play an important role in lowering either income-increasing or income-decreasing discretionary accruals.

In addition, when comparing the corporate governance results between Panel A and Panel B in Table 10.6, it can be seen that only *ACFINEXP* in Panel A is significant and positive, suggesting that audit committees consisting of more members with accounting or financial expertise contributes to higher income-increasing accruals manipulation. This finding is consistent with the results for *ACFINEXP* as reported under the firm national-city framework in Table 10.2. In comparison, *ACSIZE* and *ACMEET*, which were previously negatively significant under the firm national-city framework (Table 10.2), have become insignificant under the partner national-city framework analysis, suggesting that their monitoring role has been moderated by the partner industry expertise. Other corporate governance variables are not significant at any conventional level, suggesting that they do not play an effective role in constraining income-increasing and income-decreasing discretionary accruals.

Table 10.6: Income-increasing and income-decreasing *DAC_PERF* regression under partner national-city framework

		Panel A: Income-increasing discretionary accruals									Panel B: Income-decreasing discretionary accruals								
		Model 1			Model 2			Model 3			Model 1			Model 2			Model 3		
Variables	**+/-**	**coef.**	**t-stat**	**sig.**	**coef.**	**t-stat**	**sig.**	**coef.**	**t-stat**	**sig.**	**coef.**	**t-stat**	**sig.**	**coef.**	**t-stat**	**sig.**	**coef.**	**t-stat**	**sig.**
Intercept		-0.173	-1.660	0.049**	-0.163	-1.650	0.050*	-0.165	-1.600	0.055*	0.294	2.630	0.005***	0.301	2.820	0.003***	0.321	2.860	0.002***
TA	+	0.032	2.180	0.015**	0.030	2.210	0.014**	0.031	2.110	0.018**	-0.020	-1.360	0.088*	-0.022	-1.520	0.064*	-0.020	-1.340	0.090*
PYTAC	+	0.076	1.920	0.028**	0.076	1.930	0.028**	0.076	1.920	0.028**	-0.020	-0.760	0.224	-0.020	-0.760	0.224	-0.020	-0.760	0.223
DE	-	-0.078	-1.150	0.125	-0.075	-1.130	0.130	-0.075	-1.120	0.132	-0.047	-1.260	0.105	-0.047	-1.260	0.105	-0.048	-1.280	0.102
GROWTH	+	-0.005	-0.560	0.289	-0.005	-0.530	0.297	-0.005	-0.530	0.298	0.002	0.130	0.447	0.002	0.140	0.444	0.002	0.140	0.446
MB	+	0.001	0.290	0.388	0.000	0.220	0.411	0.000	0.230	0.410	0.003	1.500	0.068*	0.003	1.470	0.072*	0.003	1.490	0.069*
CFO	-	-0.236	-2.970	0.002***	-0.235	-2.980	0.002***	-0.236	-2.960	0.002***	-0.210	-1.650	0.050*	-0.209	-1.650	0.050*	-0.210	-1.650	0.050*
LOSS	+	-0.013	-0.420	0.337	-0.013	-0.410	0.341	-0.013	-0.410	0.341	0.017	0.510	0.306	0.017	0.510	0.306	0.017	0.510	0.307
ALTMAN	-	-0.003	-0.270	0.392	-0.002	-0.210	0.418	-0.003	-0.220	0.415	0.001	0.110	0.455	0.001	0.080	0.467	0.001	0.080	0.469
BLOCKOWN	+	-0.009	-0.970	0.166	-0.009	-1.050	0.147	-0.009	-1.040	0.150	0.005	0.490	0.312	0.006	0.520	0.301	0.006	0.510	0.304
BIG4	-	-0.021	-0.700	0.244	-0.015	-0.480	0.317	-0.015	-0.480	0.316	-0.055	-1.530	0.063*	-0.055	-1.550	0.061*	-0.056	-1.570	0.059*
SECOND	-	-0.021	-0.870	0.192	-0.020	-0.850	0.199	-0.020	-0.840	0.200	-0.070	-1.800	0.036**	-0.070	-1.800	0.036**	-0.070	-1.800	0.037**
Industry Specialist Auditor																			
PARTNAT#1		-0.020	-0.760	0.447							-0.009	-0.440	0.658						
PARCITY#1					-0.021	-1.190	0.234							0.004	0.310	0.755			
JOINT_PARTNAT#1-PARCITY#1								-0.025	-0.910	0.361							-0.008	-0.390	0.698
PARCITY#1_ONLY								-0.021	-1.040	0.298							0.008	0.460	0.646
PARNAT#1 ONLY																			
Corporate Governance																			
BODFEM		0.009	0.930	0.352	0.008	0.900	0.371	0.009	0.890	0.372	0.003	0.450	0.655	0.003	0.460	0.648	0.003	0.460	0.643
BODFOREIGN		-0.004	-0.340	0.737	-0.005	-0.400	0.689	-0.005	-0.380	0.705	0.012	1.170	0.242	0.012	1.160	0.245	0.012	1.180	0.240
INTAUD		-0.013	-0.630	0.527	-0.010	-0.530	0.596	-0.011	-0.520	0.600	0.012	0.650	0.517	0.013	0.700	0.486	0.012	0.630	0.529
ACSIZE		-0.017	-2.110	0.036	-0.017	-2.090	0.038	-0.017	-2.080	0.038	0.001	0.130	0.900	0.001	0.110	0.916	0.001	0.140	0.886
ACINDP		0.012	1.090	0.277	0.012	1.070	0.284	0.012	1.070	0.285	-0.017	-0.960	0.335	-0.018	-0.970	0.330	-0.018	-0.980	0.329
ACFINEXP		0.016	1.710	0.088*	0.016	1.720	0.086*	0.016	1.720	0.087*	0.006	0.810	0.418	0.005	0.760	0.447	0.006	0.800	0.423
ACMEET		-0.026	-2.120	0.035	-0.026	-2.120	0.034	-0.026	-2.120	0.035	0.009	0.990	0.325	0.009	1.010	0.314	0.009	0.990	0.321
Year fixed-effects			Included			Included			Included			Included			Included			Included	
Industry fixed-effects			Included			Included			Included			Included			Included			Included	
R^2			0.317			0.318			0.318			0.236			0.236			0.236	
N			395			395			395			624			624			624	

*** are significant at p<0.01, ** are significant at p<0.05 and *at p<0.10. All p-values are one-tailed, except for the industry specialist variables and the corporate governance variables which are two-tailed. Industry fixed-effects and year fixed-effects are not reported for brevity, and t-statistics and significance levels are calculated using the White (1980) robust standard errors to correct for heteroscedasticity. Refer Table 5.8 for definition of variables.

10.2.2.2 Accruals estimation error (*AEE*)

The next analysis regresses the partner industry specialist and corporate governance proxies on the accrual quality measure introduced by McNichols (2002). The results in Table 10.7 below demonstrate the effect of audit partner industry specialist auditors and corporate governance on accrual estimation error (*AEE*) (based on the McNichols (2002) accrual quality model). All the models are significant at $p<0.01$, and their adjusted R^2 is about 8.9 percent. These values, although low, are comparable with prior research conducted by Srinidhi *et al*. (2011) in this area using the same measure of accruals, which reported an R^2 of 11.5 percent.

Model 1 tests the effect of the partner national industry leadership per se (N=39) and corporate governance in reducing the *AEE*, relative to other non-Big 4 industry leading partners (N=547), whereas Model 2 tests the effect of the partner city industry leadership per se (N=162) and corporate governance in reducing the magnitude of *AEE*, relative to other non-Big 4 industry leading partners (N=662). This iterative process indicates that the top-ranked national partner reduces the *AEE*, but not the second ranked partner in the industry. The coefficient for the top-ranked national industry leading partners (*PARNAT#1*) is negative and significant (coefficient=-0.022, $p<0.10$), whereas the coefficient for the second-ranked partner is not significant at any conventional level. In Model 2, an insignificant result is reported for the *PARCITY#1* variable, suggesting that city leading partners do not play an important role in reducing the magnitude of *AEE*.

While Models 1 and 2 are provided for completeness, Model 3 is the primary model of interest because it controls explicitly for the joint effect of partner national and city-specific industry leadership through the use of three audit partner indicator variables. The first audit partner indicator variable is coded 1 for 39 observations (5 percent of the sample) in which the partner is both the top ranked national leader and top-ranked city-industry leader; the second auditor indicator variable is coded 1 for 123 observations (15 percent of the sample) in which the partner is the top city-industry leader but not the top national leader - there is no observation available for the third auditor indicator variable which is coded 1 for when the partner is the top-ranked national industry leader but not the top-ranked city-industry leader.

In other words, companies which audit using partners that are national industry leaders (N=39) are also jointly city-specific industry leaders (N=39), with none of them being national industry leaders alone (N=0). Companies audited by partners that are city-specific industry leaders (N=162) can be decomposed into those audited by city-specific industry leaders alone (N=123), plus those partners that are jointly national and city-specific industry leaders (N=39). The purpose of these three partitions is to test for the separate effects of partner national and city-specific industry leadership on the magnitude of *AEE*, as well as to isolate the joint effect of partner national and city-specific industry leadership on the magnitude of *AEE*. The default comparison group is the 423 observations (80 percent of sample) in which the partner is

Table 10.7: *AEE* Regression under partner national-city framework

		Model 1				Model 2				Model 3			
Variables	**+/-**	**coef.**	**t-stat**	**p-value**	**sig.**	**coef.**	**t-stat**	**p-value**	**sig.**	**coef.**	**t-stat**	**p-value**	**sig.**
Intercept		0.170	2.740	0.003	***	0.184	3.060	0.001	***	0.170	2.740	0.003	***
TA	+	-0.005	-0.590	0.277		-0.007	-0.880	0.190		-0.005	-0.600	0.276	
PYTAC	+	-0.011	-0.830	0.203		-0.011	-0.830	0.205		-0.011	-0.830	0.203	
DE	-	0.006	0.180	0.430		0.007	0.190	0.426		0.006	0.180	0.431	
GROWTH	+	-0.003	-0.300	0.382		-0.002	-0.290	0.386		-0.003	-0.300	0.383	
MB	+	0.000	0.240	0.404		0.000	0.160	0.438		0.000	0.240	0.404	
CFO	-	-0.031	-1.070	0.142		-0.029	-1.010	0.158		-0.031	-1.070	0.143	
LOSS	+	0.008	0.830	0.204		0.008	0.840	0.200		0.008	0.830	0.205	
ALTMAN	-	-0.008	-1.680	0.047	**	-0.008	-1.630	0.052	**	-0.008	-1.690	0.046	**
BLOCKOWN	+	0.001	0.220	0.412		0.001	0.300	0.383		0.001	0.230	0.410	
BIG4	-	-0.004	-0.250	0.401		-0.002	-0.140	0.445		-0.004	-0.250	0.400	
SECOND	-	-0.009	-0.550	0.291		-0.009	-0.540	0.293		-0.009	-0.550	0.291	
Industry Specialist Auditor													
PARNAT#1 (n=39)		-0.022	-1.710	0.088	*								
PARCITY#1 n=162)						-0.004	-0.420	0.675					
PARJOINT_PARNAT#1-PARCITY (n=39)										-0.022	-1.670	0.096	*
PARCITY#1_ONLY (n=123)										0.000	0.020	0.982	
PARNAT#1_ONLY (n=0)													
Corporate Governance													
BODFEM		0.010	1.610	0.107		0.009	1.550	0.120		0.010	1.600	0.110	
BODFOREIGN		0.002	0.370	0.714		0.001	0.240	0.811		0.002	0.370	0.714	
INTAUD		-0.014	-1.210	0.225		-0.013	-1.080	0.279		-0.014	-1.220	0.225	
ACSIZE		-0.004	-0.800	0.423		-0.004	-0.840	0.402		-0.004	-0.800	0.424	
ACINDP		0.015	2.560	0.011	**	0.015	2.570	0.010	**	0.015	2.540	0.011	**
ACFINEXP		-0.003	-0.490	0.623		-0.003	-0.570	0.572		-0.003	-0.500	0.619	
ACMEET		0.000	-0.090	0.930		0.000	-0.080	0.938		0.000	-0.090	0.930	
Year fixed-effects		Included				Included				Included			
Industry fixed-effects		Included				Included				Included			
R^2		0.081				0.080				0.081			
N		824				824				824			

*** are significant at p<0.01, ** are significant at p<0.05 and *at p<0.10. All p-values are one-tailed, except for the industry specialist auditor variables and corporate governance variables which are two-tailed. Industry fixed-effects and year fixed-effects are not reported for brevity, and t-statistics and significance levels are calculated using the White (1980) robust standard errors to correct for heteroscedasticity. Refer Table 5.8 for definition of variables.

neither the top national nor top city industry leader. Interestingly, the *PARJOINT_PARNAT#1-PARCITY#1* variable is negative and significant (coefficient=-0.022, $p<0.05$), suggesting that the audit partner who is a joint national and city-specific industry leader constrains earnings management through reducing the *AEE*, while audit partner national or city industry leadership alone does not.

In respect of the corporate governance variables, interestingly, none of the corporate governance examined is significant at any conventional level, except for *ACINDP* which is significant at $p<0.05$. This finding of *ACINDP* is consistent with the one reported in Table 10.3 under the firm national-city framework. For the control variables, only *ALTMAN* is significant at $p<0.10$ in the predicted directions across all of the model estimations, whereas *TA*, *PYTAC*, *DE*, *GROWTH*, *MB*, *CFO*, *LOSS* and *BLOCKOWN* are not significant.

10.2.2.3 Likelihood to report a profit / (avoid a loss) (*PROFIT*)

Next, a probit model is used to examine the likelihood of companies reporting a profit rather than a loss when audited by partners who are industry specialists and who have effective corporate governance. The adjusted R^2 for all models in Table 10.8 below ranges between 37.4 percent and 37.6 percent and is significant ($p<0.01$), suggesting that the models are statistically valid, though slightly lower as compared to the regression model used by Francis *et al*. (2011) in their cross-country study with an R^2 of 45.5 percent.

Model 1 tests the effect of the partner national industry leadership per se (N=39) and corporate governance on their likelihood to report a profit rather than a loss, relative to other non-industry leading Big 4 partners (N=980), whereas Model 2 tests the effect of the partner city industry leadership per se (N=178) and corporate governance on their likelihood to report a profit rather than a loss, relative to other non-industry leading Big 4 partners (N=841). Based on the results of Model 1 and Model 2, neither *PARNAT#1* nor *PARCITY#1* are significant, suggesting that there is no sufficient evidence to indicate that partners who are either national or city industry leaders are more conservative in their profit reporting.

While Models 1 and 2 are provided for completeness, Model 3 is the primary model of interest because it controls explicitly for the joint effect of partner national and city-specific industry leadership through the use of three auditor indicator variables. The first auditor indicator variable is coded 1 for 39 observations (4 percent of the sample) in which the partner is both the top-ranked national leader and top-ranked city-specific industry leader; the second auditor indicator variable is coded 1 for 139 observations (14 percent of the sample) in which the partner is the top-ranked city-specific industry leader but not the top-ranked national leader, whereas there is no observation available for the third auditor indicator variable which is coded 1 for when the auditor is the top national industry leader but not the top-ranked city-specific industry leader.

Table 10.8: *PROFIT* Regression under partner national-city framework

		Model 1				Model 2				Model 3			
Variables	**+/-**	**coef.**	**t-stat**	**p-value**	**sig.**	**coef.**	**t-stat**	**p-value**	**sig.**	**coef.**	**t-stat**	**p-value**	**sig.**
Intercept		-1.119	-1.350	0.088	*	-1.185	-1.460	0.072	*	-0.982	-1.180	0.119	
TA	+	0.190	1.780	0.038	**	0.204	1.950	0.026	**	0.173	1.610	0.054	**
LEV	-	0.048	0.120	0.454		0.069	0.170	0.434		0.086	0.210	0.418	
TAC	-	-1.743	-2.900	0.002	***	-1.781	-2.950	0.002	***	-1.770	-2.950	0.002	***
GROWTH	+	0.122	1.450	0.074	*	0.120	1.430	0.077	*	0.122	1.450	0.073	*
MB	+	0.016	1.280	0.101		0.017	1.380	0.083	*	0.015	1.220	0.111	
CFO	+	2.496	3.850	0.000	***	2.485	3.810	0.000	***	2.508	3.850	0.000	***
LAG LOSS	-	-0.784	-6.610	0.000	***	-0.785	-6.610	0.000	***	-0.788	-6.630	0.000	***
ALTMAN	+	0.225	2.600	0.005	***	0.230	2.650	0.004	***	0.233	2.700	0.004	***
BLOCKOWN	-	0.008	0.140	0.444		-0.007	-0.130	0.449		-0.002	-0.030	0.487	
BIG4	-	-0.078	-0.470	0.320		-0.045	-0.270	0.393		-0.014	-0.080	0.468	
SECOND	-	0.081	0.490	0.311		0.075	0.460	0.323		0.082	0.500	0.309	
Industry Specialist Auditor													
PARNAT#1 (n=39)		0.193	0.630	0.531									
PARCITY#1 (178)						-0.194	-1.350	0.178					
JOINT_PARNAT#1-PARCITY#1 (n=39)										0.153	0.490	0.624	
PARCITY#1 _ONLY (n=139)										-0.255	-1.630	0.103	
PARNAT#1_ONLY (n=0)													
Corporate Governance													
BODFEM		0.003	0.040	0.969		0.002	0.030	0.978		-0.002	-0.020	0.981	
BODFOREIGN		-0.085	-1.280	0.201		-0.077	-1.160	0.244		-0.087	-1.310	0.189	
INTAUD		0.157	1.080	0.279		0.154	1.070	0.284		0.176	1.210	0.226	
ACSIZE		0.021	0.290	0.775		0.024	0.340	0.737		0.018	0.240	0.808	
ACINDP		-0.003	-0.040	0.972		0.002	0.030	0.979		0.003	0.040	0.969	
ACFINEXP		0.013	0.220	0.827		0.019	0.330	0.740		0.014	0.240	0.813	
ACMEET		-0.032	-0.480	0.631		-0.032	-0.480	0.630		-0.031	-0.460	0.643	
Year fixed-effects		Included				Included				Included			
Industry fixed-effects		Included				Included				Included			
R^2		0.374				0.375				0.376			
N		1,019				1,019				1,019			

*** are significant at p<0.01, ** are significant at p<0.05 and *at p<0.10. All p-values are one-tailed, except for the industry specialist auditor variables and the corporate governance variables which are two-tailed. Industry fixed-effects and year fixed-effects are not reported for brevity, and t-statistics and significance levels are calculated using the White (1980) robust standard errors to correct for heteroscedasticity. Refer Table 5.8 for definition of variables.

In other words, companies with partners that are national industry leaders (N=39) are also jointly city-specific industry leaders (N=39), with none of them being national industry leaders alone (N=0). Companies with partners that are city-specific industry leaders (N=178) can be decomposed into those audited by partners who are city-specific industry leaders alone (N=139), plus those partners that are jointly national and city-specific industry leaders (N=39). The purpose of these three partitions is to test for the separate effects of partners national and city-specific industry leadership on their likelihood to report a profit rather than a loss, relative to other Big 4 partners who are non-leaders. The default comparison group is the 841 observations (82 percent of sample) in which the audit partner is neither the top-ranked national nor the top-ranked city-industry leader. Results from Model 3 indicate that none of the partner indicator variables are significant at p=0.10, suggesting that there is no sufficient evidence to suggest that Big 4 partners industry leadership affects its conservatism in profit reporting, relative to other non-Big 4 industry leading partners.

Consistent with Table 10.4 earlier under the firm national-city framework, none of the corporate governance variables are significant at any conventional level, suggesting that the variation in the company's corporate governance characteristics does not have a significant effect on the company's likelihood of reporting profit (or loss). Control variables *TAC, MB, CFO, LAG_LOSS* and *ALTMAN* are positive and significant, suggesting that companies which have lower accruals, higher growth, lower operating cash flows, experienced loss in the previous year, and have a higher risk of bankruptcy are more likely to report a profit rather than a loss.

Overall, the results of the earnings quality analysis under the audit partner national and city framework for auditor industry specialisation while controlling for the effect of corporate governance do not show consistent evidence that audit partner industry leadership in the U.K. is important in promoting earnings quality. This is the first set of audit partner data that is reported in the U.K. and the results may be different when more data from other years is incorporated in future research.

10.2.3 Joint firm-partner national-city framework

So far, the results from the firm national-city framework and partner national-city framework for auditor industry specialisation offer conflicting results. While firm national-city industry leadership does have a positive effect in promoting higher earnings quality, partner industry leadership does not show an important effect. However, it could be argued that the results from the firm level perspective and partner level perspective alone suffer from omitted variable bias, due to the failure to control for the confounding effect of the audit firm industry leadership either at the national or city level, as similarly argued in the audit pricing analysis in Chapter 7. This means that the effect of the audit partner in promoting earnings quality is subsumed within the effect of audit firm industry leadership. The same applies to the results of earnings management under the audit firm national-city framework, where the confounding effect of the partner industry leadership was not controlled for in the firm industry leadership analysis. Thus, there is a possibility that the reported significance or insignificance in these two models is understated due to omitted variable bias. To correct for this effect, this study adopts the joint firm-partner national-city framework where it examines the importance of partner-level industry expertise and firm level industry expertise simultaneously to determine which type of industry leadership is more important and effective in improving a firm's earnings quality (the same approach has been used in the audit quality analysis in Chapter 7). The joint firm-partner national-city framework represents the contribution of this study to the auditor industry specialisation literature, given that it has not yet been tested before in other countries.

10.2.3.1 Performance-matched discretionary accruals (*DAC_PERF*)

For the results in Table 10.10 below, the coding for the joint firm-partner industry leadership is derived from the analysis in Table 10.1 and Table 10.5 above. The firm industry leadership is based on the combination of the top two national industry leaders and the top-ranked city industry leader, whereas the partner industry leadership is based on the combination of the top-ranked national industry leader and the top-ranked city industry leader.

The combinations of the firm national-city framework and partner national-city framework results in the creation of 15 new variables to be examined under the joint firm-partner national-city framework analysis. These variables are described in detail in Table 10.9 below. The R^2 is 23.2 percent and is significant at p<0.01. Given that the sample size for the joint firm-partner national-city framework is N=680, then the default group is N=173 and is comprised of both audit firms and partners who are not leaders either at the national or the city-industry level.

From the joint firm-partner national-city framework tests, as shown in Table 10.10 below, evidence indicates that audit firms that are both national and city-specific industry leaders seem to constrain discretionary accruals either when the partner is both joint national and city-specific industry leaders (*NAT#2-CITY#1_PARNAT#1-PARCITY#1*) or when the partner is only leader at the city-specific industry level but not nationally (*NAT#2-CITY#1_PARNAT#0-PARCITY#1*), where the coefficients are -0.036 (p<0.10) and -0.032 (p<0.10), respectively. Firm joint national and city-specific industry leadership proves to be important beyond partner industry leadership as the variable representing joint firm national and city-specific industry leadership without partner industry leadership *NAT#2-CITY#1_PARNAT#0-PARCITY#0* is negatively significant (coefficient=-0.030, p<0.10). However, *NAT#0-CITY#1_PARNAT#0-PARCITY#0* is also negative and significant (coefficient=-0.074, p<0.05), suggesting that in certain cities the firm industry leadership position is more crucial than other industry leadership positions. Nevertheless, this finding needs to be interpreted with caution due to the small number of observations (less than 10), although the result is significant.

Table 10.9: Definition of industry specialist auditor variables under the joint firm-partner national-city framework for *DAC_PERF* analysis

Variable	N	Variable definition
NAT#2-CITY#1_PARNAT#1-PARCITY#1	39	Indicator variable = 1 if the *audit firm* is in the top two ranked by market share nationally (*NAT#2*), the *office* is the top-ranked by city-industry market share (*CITY#1*), the *audit partner* is the top-ranked by market share nationally (*PARNAT#1*), and the *audit partner* is the top-ranked by city-industry market share (*PARCITY#1*), and zero otherwise;
NAT#2-CITY#1_PARNAT#0-PARCITY#1	93	Indicator variable = 1 if the *audit firm* is in the top two ranked by market share nationally (*NAT#2*), the *office* is the top-ranked by city-industry market share (*CITY#1*), the *audit partner* is not the top-ranked by market share nationally (*PARNAT#0*), and the *audit partner* is the top-ranked by city-industry market share (*PARCITY#1*), and zero otherwise;
NAT#2-CITY#0_PARNAT#1-PARCITY#1	0	Indicator variable = 1 if the *audit firm* is in the top two ranked by market share nationally (*NAT#2*), the *office* is not the top-ranked by city-industry market share (*CITY#0*), the *audit partner* is the top-ranked by market share nationally (*PARNAT#1*), and the *audit partner* is the top-ranked by city-industry market share (*PARCITY#1*), and zero otherwise;
NAT#2-CITY#0_PARNAT#0-PARCITY#1	2	Indicator variable = 1 if the *audit firm* is in the top two ranked by market share nationally (*NAT#2*), the *office* is not the top-ranked by city-industry market share (*CITY#0*), the *audit partner* is not the top-ranked by market share nationally (*PARNAT#0),* and the *audit partner* is the top-ranked by city-industry market share (*PARCITY#1*), and zero otherwise;
NAT#0-CITY#1_PARNAT#1-PARCITY#1	0	Indicator variable = 1 if the *audit firm* is not in the top two ranked by market share nationally (*NAT#0*), the *office* is the top-ranked by city-industry market share (*CITY#1*), the *audit partner* is the top-ranked by market share nationally (*PARNAT#1*), and the *audit partner* is the top-ranked by city-industry market share (*PARCITY#1*), and zero otherwise;
NAT#0-CITY#1_PARNAT#0-PARCITY#1	42	Indicator variable = 1 if the *audit firm* is not in the top two ranked by market share nationally (*NAT#0*), the *office* is the top-ranked by city-industry market share (*CITY#1*), the *audit partner* is not the top-ranked by market share nationally (*PARNAT#0*), and the *audit partner* is the top-ranked by city-industry market share (*PARCITY#1*), and zero otherwise;
NAT#0-CITY#0_PARNAT#1-PARCITY#1	0	Indicator variable = 1 if the *audit firm* is not in the top two ranked by market share nationally (*NAT#0*), the *office* is not the top-ranked by city-industry market share (*CITY#0*), the *audit partner* is the top-ranked by market share nationally (*PARNAT#1*), and the *audit partner* is the top-ranked by city-industry market share (*PARCITY#1*), and zero otherwise;
NAT#0-CITY#0_PARNAT#0-PARCITY#1	7	Indicator variable = 1 if the *audit firm* is not in the top two ranked by market share nationally (*NAT#0*), the *office* is not the top-ranked by city-industry market share (*CITY#0*), the *audit partner* is not the top-ranked by market share

		nationally (*PARNAT#0*), and the *audit partner* is the top-ranked by city-industry market share (*PARCITY#1*), and zero otherwise;
NAT#2-CITY#1_PARNAT#1-PARCITY#0	0	Indicator variable = 1 if the *audit firm* is in the top two ranked by market share nationally (*NAT#*1), the *office* is the top- ranked by city-industry market share (*CITY#1*), the *audit partner* is the top-ranked by market share nationally (*PARNAT#1*), and the *audit partner* is not the top-ranked by city-industry market share (*PARCITY#0*), and zero otherwise;
NAT#2-CITY#1_PARNAT#0-PARCITY#0	131	Indicator variable = 1 if the *audit firm* is in the top two ranked by market share nationally (*NAT#2*), the *office* is the top-ranked by city-industry market share (*CITY#1*), the *audit partner* is not the top-ranked by market share nationally (*PARNAT#0*), and the *audit partner* is not the top-ranked by city-industry market share (*PARCITY#0*), and zero otherwise;
NAT#2-CITY#0_PARNAT#1-PARCITY#0	0	Indicator variable = 1 if the *audit firm* is in the top two ranked by market share nationally (*NAT#2*), the *office* is not the top-ranked by city-industry market share (*CITY#0*), the *audit partner* is the top-ranked by market share nationally (*PARNAT#1*), and the *audit partner* is not the top-ranked by city-industry market share (*PARCITY#0*), and zero otherwise;
NAT#2-CITY#0_PARNAT#0-PARCITY#0	185	Indicator variable = 1 if the *audit firm* is in the top two ranked by market share nationally (*NAT#2*), the *office* is not the top-ranked by city-industry market share (*CITY#0*), the *audit partner* is not the top-ranked by market share nationally (*PARNAT#0*), and the *audit partner* is not the top-ranked by city-industry market share (*PARCITY#0*), and zero otherwise;
NAT#0-CITY#1_PARNAT#1-PARCITY#0	0	Indicator variable = 1 if the *audit firm* is not in the top two ranked by market share nationally (*NAT#0*), the *office* is the top-ranked by city-industry market share (*CITY#1*), the *audit partner* is the top-ranked by market share nationally (*PARNAT#1*), and the *audit partner* is not the top-ranked by city-industry market share (*PARCITY#0*), and zero otherwise;
NAT#0-CITY#1_PARNAT#0-PARCITY#0	8	Indicator variable = 1 if the *audit firm* is not in the top two ranked by market share nationally (*NAT#0*), the *office* is the top-ranked by city-industry market share (*CITY#1*), the *audit partner* is not the top-ranked by market share nationally (*PARNAT#0*), and the *audit partner* is not the top-ranked by city-industry market share (*PARCITY#0*), and zero otherwise;
NAT#0-CITY#0_PARNAT#1-PARCITY#0	0	Indicator variable = 1 if the *audit firm* is not in the top two ranked by market share nationally (*NAT#0*), the *office* is not the top-ranked by city-industry market share (*CITY#0*), the *audit partner* is the top-ranked by market share nationally (*PARNAT#1*), and the *audit partner* is not the top-ranked by city-industry market share (*PARCITY#0*), and zero otherwise;

Table 10.10: *DAC_PERF* Regression under joint firm-partner national-city framework

Variables	+/-	coef.	t-stat	p-value	sig.
Intercept		0.120	1.520	0.065	**
TA	+	-0.002	-0.230	0.410	
PYTAC	+	0.024	1.030	0.152	
DE	-	-0.048	-1.450	0.074	*
GROWTH	+	-0.005	-0.600	0.276	
MB	+	0.002	1.220	0.112	
CFO	-	-0.204	-2.730	0.004	***
LOSS	+	0.012	0.520	0.303	
ALTMAN	-	-0.002	-0.200	0.422	
BLOCKOWN	+	-0.002	-0.180	0.429	
BIG4	-	-0.011	-0.450	0.327	
SECOND	-	-0.045	-1.890	0.030	**
Industry Specialist Auditor					
NAT#2-CITY#1_PARNAT#1-PARCITY#1 (n=39)		-0.036	-1.840	0.066	*
NAT#2-CITY#1_PARNAT#0-PARCITY#1 (n=93)		-0.032	-1.920	0.055	*
NAT#2-CITY#0_PARNAT#1-PARCITY#1 (n=0)					
NAT#2-CITY#0_PARNAT#0-PARCITY#1 (n=2)		-0.022	-0.360	0.720	
NAT#0-CITY#1_PARNAT#1-PARCITY#1 (n=0)					
NAT#0-CITY#1_PARNAT#0-PARCITY#1 (n=42)		-0.001	-0.050	0.961	
NAT#0-CITY#0_PARNAT#1-PARCITY#1 (n=0)					
NAT#0-CITY#0_PARNAT#0-PARCITY#1 (n=7)		-0.037	-1.430	0.152	
NAT#2-CITY#1_PARNAT#1-PARCITY#0 (n=0)					
NAT#2-CITY#1_PARNAT#0-PARCITY#0 (n=131)		-0.030	-1.890	0.059	*
NAT#2-CITY#0_PARNAT#1-PARCITY#0 (n=0)					
NAT#2-CITY#0_PARNAT#0-PARCITY#0 (n=185)		-0.020	-1.300	0.195	
NAT#0-CITY#1_PARNAT#1-PARCITY#0 (n=0)					
NAT#0-CITY#1_PARNAT#0-PARCITY#0 (n=8)		-0.074	-2.400	0.017	**
NAT#0-CITY#0_PARNAT#1-PARCITY#0 (n=0)					
Corporate Governance					
BODFEM		0.008	1.330	0.182	
BODFOREIGN		0.007	0.940	0.345	
INTAUD		-0.002	-0.140	0.886	
ACSIZE		-0.007	-1.050	0.294	
ACINDP		-0.002	-0.200	0.840	
ACFINEXP		0.012	2.100	0.036	**
ACMEET		-0.003	-0.460	0.645	
Year fixed-effects			Included		
Industry fixed-effects			Included		
R^2			0.232		
N			1,019		

*** are significant at p<0.01, ** are significant at p<0.05 and *at p<0.10. All p-values are one-tailed, except for the industry specialist auditor variables and the corporate governance variables which are two-tailed. Industry fixed-effects and year fixed-effects are not reported for brevity, and t-statistics and significance levels are calculated using the White (1980) robust standard errors to correct for heteroscedasticity. Refer Table 5.8 for definition of variables.

Interestingly, none of the corporate governance variables are significant at any conventional level, except for *ACFINEXP*, which is positive and significant (coefficient=0.012, p<0.05). This finding for *ACFINEXP* is consistent with previous *DAC_PERF* using the firm national-city framework (Table 10.1) and partner national-city framework (Table 10.5). For the control variables, *DE*, *CFO* and *SECOND* are negative and significant at p<0.10, which is consistent with Reichelt and Wang (2010), Minutti-Meza (2013), and Francis *et al*. (2013), suggesting that abnormal accruals are larger for firms that have lower leverage (*DE*) and lower operating cash flow (*CFO*) and are audited by the second-tier audit firm (*SECOND*). Other control variables, *TA*, *PYTAC*, *GROWTH*, *MB* and *BLOCKOWN*, are not significant at any conventional level.

Next, the study examines the effect of joint firm-partner national-city industry leadership and corporate governance on income-increasing (*DAC_PERF* ≥ 0) and income-decreasing discretionary accruals (*DAC_PERF* < 0). Table 10.11, Panel A below reports the estimation results where the dependent variable is the income increasing discretionary accruals; Panel B reports the estimation results where the dependent variable is the income decreasing abnormal accruals. The model in Table 10.11, Panel A, is significant (p<0.01), and the adjusted R^2 is 33.7 percent. The reported results in Panel A are consistent with those reported in Table 10.11. Evidence indicates that audit firms which are both national and city-specific industry leaders constrain discretionary accruals either when the partner is both joint national and city-specific industry leaders (*NAT#2-CITY#1_PARNAT#1-PARCITY#1*) or when the partner is only leader at the city-specific industry level but not nationally (*NAT#2-CITY#1_PARNAT#0-PARCITY#1*), where the coefficients are -0.077 (p<0.10) and -0.067 (p<0.10), respectively. Firm joint national industry leadership proves to be important beyond partner industry leadership as the coefficient for NAT#2-*CITY#1_PARNAT#0-PARCITY#0* is significant and negative (coefficient = -0.085, p<0.05). The firm industry leadership is driven by the firm leadership position at the national level as NAT#2-*CITY#0_PARNAT#0-PARCITY#0* is also negatively significant (coefficient = -0.064, p<0.10). Taken together, this result indicates that audit firm industry leadership at the national level drives earnings quality in the U.K. public listed companies market. However, *NAT#0-CITY#0_PARNAT#0-PARCITY#1* is also negative and significant (coefficient = -0.085, p<0.05), suggesting that in certain cities the partner industry leadership position is more crucial than other industry leadership positions. Nevertheless, this finding needs to be interpreted with caution due to its small number of observations (less than 10), although the result is significant.

In respect of the corporate governance variables, *ACSIZE* and *ACMEET* are negative and significant (coefficient = -0.018, p<0.05 and coefficient= -0.030, p<0.05, respectively), suggesting that a larger size and active audit committee constrain income-increasing discretionary accruals. On the other hand, *ACFINEXP* is positive and significant (coefficient= 0.016, p<0.10), which indicates that the more financially expert members there are in the audit committee actually increases the risk of earning manipulation through income-increasing accruals. Other corporate governance variables *BODFEM*, *BODFOREIGN*, *INTAUD* and *ACINDP* are not significant at any conventional level.

Examining Table 10.11, Panel B, the model is significant (p<0.01) and the adjusted R^2 is 24 percent. Interestingly, none of the industry specialist auditor variables across the model estimations are significant, except for *NAT#2-CITY#0_PARNAT#0-PARCITY#1* and *NAT#0-CITY#1_PARNAT#0-PARCITY#0* which are negatively significant (coefficient= -0.075, p<0.10 and coefficient= -0.099, p<0.05, respectively). Nevertheless, this finding needs to be interpreted with caution due to its small number of observations (less than 10), although the result is significant. Comparing the results of industry specialist auditors in Panel A and Panel B, it seems that only the results for the income-increasing discretionary accruals corroborate the earlier findings using the magnitude of discretionary accruals reported in Table 10.10 above. This shows that audit firms with leading industry expertise are more concerned about income-increasing earnings management than income-decreasing earnings management.

Table 10.11: Income-increasing and income-decreasing *DAC_PERF* Regression under joint firm partner national-city framework

		Panel A: Income-increasing discretionary accruals				Panel B: Income-decreasing discretionary accruals			
Variables	**+/-**	**coef.**	**t-stat**	**p-value**	**sig.**	**coef.**	**t-stat**	**p-value**	**sig.**
Intercept		-0.191	-1.790	0.037	**	0.315	2.770	0.003	***
TA	+	0.034	2.300	0.011		-0.019	-1.260	0.104	
PYTAC	+	0.081	1.960	0.026	**	-0.020	-0.760	0.224	
DE	-	-0.072	-1.090	0.138		-0.057	-1.400	0.082	*
GROWTH	+	-0.001	-0.130	0.450		0.002	0.160	0.438	
MB	+	0.000	-0.110	0.458		0.003	1.460	0.072	*
CFO	-	-0.237	-3.020	0.002	***	-0.218	-1.670	0.048	**
LOSS	+	-0.013	-0.420	0.339		0.018	0.530	0.298	
ALTMAN	-	-0.003	-0.210	0.416		0.002	0.210	0.418	
BLOCKOWN	+	-0.009	-0.970	0.168		0.006	0.530	0.299	
BIG4	-	0.030	0.700	0.242		-0.056	-1.610	0.055	*
SECOND	-	-0.020	-0.840	0.202		-0.070	-1.790	0.037	**
<u>*Industry Specialist Auditor*</u>									
NAT#2-CITY#1_PARNAT#1-PARCITY#1		-0.077	-1.870	0.062	*	-0.010	-0.400	0.693	
NAT#2-CITY#1_PARNAT#0-PARCITY#1		-0.067	-1.970	0.050	*	-0.007	-0.410	0.684	
NAT#2-CITY#0_PARNAT#1-PARCITY#1									
NAT#2-CITY#0_PARNAT#0-PARCITY#1		-0.261	-2.710	0.007	***	0.075	1.900	0.058	*
NAT#0-CITY#1_PARNAT#1-PARCITY#1									
NAT#0-CITY#1_PARNAT#0-PARCITY#1		-0.045	-0.960	0.340		0.033	0.950	0.341	
NAT#0-CITY#0_PARNAT#1-PARCITY#1									
NAT#0-CITY#0_PARNAT#0-PARCITY#1		-0.085	-2.160	0.031	**	0.034	1.100	0.272	
NAT#2-CITY#1_PARNAT#1-PARCITY#0									
NAT#2-CITY#1_PARNAT#0-PARCITY#0		-0.085	-2.590	0.010	**	-0.003	-0.160	0.873	
NAT#2-CITY#0_PARNAT#1-PARCITY#0									
NAT#2-CITY#0_PARNAT#0-PARCITY#0		-0.064	-1.840	0.066	*	0.005	0.300	0.765	
NAT#0-CITY#1_PARNAT#1-PARCITY#0									
NAT#0-CITY#1_PARNAT#0-PARCITY#0		-0.037	-1.050	0.296		-0.099	-2.120	0.034	**
NAT#0-CITY#0_PARNAT#1-PARCITY#0									
<u>*Corporate Governance*</u>									
BODFEM		0.012	1.320	0.186		0.003	0.440	0.663	
BODFOREIGN		-0.005	-0.360	0.717		0.013	1.250	0.213	
INTAUD		-0.009	-0.460	0.647		0.012	0.640	0.521	
ACSIZE		-0.018	-2.140	0.033	**	0.002	0.210	0.831	
ACINDP		0.012	1.110	0.269		-0.017	-0.960	0.337	
ACFINEXP		0.016	1.730	0.084	*	0.006	0.840	0.399	
ACMEET		-0.030	-2.350	0.019	**	0.009	1.030	0.304	
Year fixed-effects		Included				Included			
Industry fixed-effects		Included				Included			
R^2		0.337				0.240			
N		395				624			

*** are significant at p<0.01, ** are significant at p<0.05 and *at p<0.10. All p-values are one-tailed, except the industry specialist auditor variables and the corporate governance variables which are two-tailed. Industry fixed-effects and year fixed-effects are not reported for brevity, and t-statistics and significance levels are calculated using the White (1980) robust standard errors to correct for heteroscedasticity. Refer Table 5.8 for definition of variables.

In addition, when comparing the corporate governance results between Panel A and Panel B in Table 10.11, it can be seen from Panel A that *ACSIZE* and *ACMEET* are negative and significant, whereas *ACFINEXP* is positive and significant. On the other hand, none of the corporate governance variables in Panel B are significant. These findings are consistent with the corporate governance results reported earlier under the firm national-city framework analysis (Panel A and Panel B of Table 10.2) for income-increasing and income-decreasing discretionary accruals. This suggests that corporate governance only plays an effective role in reducing income-increasing discretionary accruals, but not for constraining income-decreasing discretionary accruals.

10.2.3.2 Accrual estimation error (*AEE*)

For the results in Table 10.13, the coding for the joint firm-partner industry leadership is derived from analysis in Table 10.3 and Table 10.6 above, where the firm industry leadership is based on the combination of the top-ranked national industry leader and the top-ranked city industry leader; the partner industry leadership is also based on the combination of the top-ranked national industry leader and the top-ranked city industry leader. The R^2 is 8.7 percent and is significant at $p<0.01$. The definition for the industry specialist auditor variables under the joint firm-partner national-city framework is given in Table 10.12. Given that the sample size for the joint firm-partner national-city framework is N=680, then the default group is N=322 and is comprised of both audit firms and partners who are not leaders either at the national or city-industry level.

For the joint firm-partner national-city framework tests, only two variables are significant. *NAT#1-CITY#1_PARNAT#1-PARCITY#1* is negative and significant (coefficient= -0.028, $p<0.10$), suggesting that combined leadership of the firm and the partner at the national and city level is associated with a lower level of *AEE*. However, *NAT#1-CITY#1_PARNAT#0-PARCITY#0* is also negative and significant (coefficient= -0.020, $p<0.05$), which indicates that firm joint industry leadership is more important above and beyond the audit partner industry leadership in their ability to reduce *AEE*. An *F*-test indicates that there are no significant differences between the coefficients for *NAT#1-CITY#1_PARNAT#1-PARCITY#1* and *NAT#1-CITY#1_PARNAT#0-PARCITY#0* (*F*-statistic=0.000, $p=0.986$), which indicates that firm joint industry leadership either alone or in conjunction with partner industry leadership is equally effective in constraining accrual estimation error. This shows that there is no incremental value provided by the partner leadership in reducing *AEE*.

In respect of the audit committee characteristics, *BODFEM* and *ACINDP* are significant and positive (coefficient = 0.011, $p<0.10$ and coefficient = 0.015, $p<.05$, respectively), suggesting that the more female directors there are on the board and the more independent members there are on the audit committee, the higher is the risk of earnings manipulation as evidenced by the higher level of *AEE*. This finding contradicts a prior study by Srinidhi *et al*. (2011) which reports negative association

Table 10.12: Definition of industry specialist auditor variables under the joint firm-partner national-city framework for *AEE* analysis

Variable	***N***	**Variable definition**
NAT#1-CITY#1_PARNAT#1-PARCITY#1	38	Indicator variable = 1 if the *audit firm* is the top-ranked by market share nationally (*NAT#1*), the *office* is the top-ranked by city-industry market share (*CITY#1*), the *audit partner* is the top-ranked by market share nationally (*PARNAT#1*), and the *audit partner* is the top-ranked by city-industry market share (*PARCITY#1*), and zero otherwise;
NAT#1-CITY#1_PARNAT#0-PARCITY#1	58	Indicator variable = 1 if the *audit firm* is the top-ranked by market share nationally (*NAT#1*), the *office* is the top-ranked by city-industry market share (*CITY#1*), the *audit partner* is not the top-ranked by market share nationally (*PARNAT#0*), and the *audit partner* is the top-ranked by city-industry market share (*PARCITY#1*), and zero otherwise;
NAT#1-CITY#0_PARNAT#1-PARCITY#1	0	Indicator variable = 1 if the *audit firm* is the top-ranked by market share nationally (*NAT#1*), the *office* is not the top-ranked by city-industry market share (*CITY#0*), the *audit partner* is the top-ranked by market share nationally (*PARNAT#1*), and the *audit partner* is the top-ranked by city-industry market share (*PARCITY#1*), and zero otherwise;
NAT#1-CITY#0_PARNAT#0-PARCITY#1	0	Indicator variable = 1 if the *audit firm* is the top-ranked by market share nationally (*NAT#1*), the *office* is not the top-ranked by city-industry market share (*CITY#0*), the *audit partner* is not the top-ranked by market share nationally (*PARNAT#0),* and the *audit partner* is the top-ranked by city-industry market share (*PARCITY#1*), and zero otherwise;
NAT#0-CITY#1_PARNAT#1-PARCITY#1	1	Indicator variable = 1 if the *audit firm* is not the top-ranked by market share nationally (*NAT#0*), the *office* is the top-ranked by city-industry market share (*CITY#1*), the *audit partner* is the top-ranked by market share nationally (*PARNAT#1*), and the *audit partner* is the top-ranked by city-industry market share (*PARCITY#1*), and zero otherwise;
NAT#0-CITY#1_PARNAT#0-PARCITY#1	77	Indicator variable = 1 if the *audit firm* is not the top-ranked by market share nationally (*NAT#0*), the *office* is the top-ranked by city-industry market share (*CITY#1*), the *audit partner* is not the top-ranked by market share nationally (*PARNAT#0*), and the *audit partner* is the top-ranked by city-industry market share (*PARCITY#1*), and zero otherwise;
NAT#0-CITY#0_PARNAT#1-PARCITY#1	0	Indicator variable = 1 if the *audit firm* is not the top-ranked by market share nationally (*NAT#0*), the *office* is not the top-ranked by city-industry market share (*CITY#0*), the *audit partner* is the top-ranked by market share nationally (*PARNAT#1*), and the *audit partner* is the top-ranked by city-industry market share (*PARCITY#1*), and zero otherwise;
NAT#0-CITY#0_PARNAT#0-PARCITY#1	9	Indicator variable = 1 if the *audit firm* is not the top-ranked by market share nationally (*NAT#0*), the *office* is not the top-ranked by city-industry market share (*CITY#0*), the *audit partner* is not the top-ranked by market share

		nationally (*PARNAT#0*), and the *audit partner* is the top-ranked by city-industry market share (*PARCITY#1*), and zero otherwise;
NAT#1-CITY#1_PARNAT#1-PARCITY#0	0	Indicator variable = 1 if the *audit firm* is in the top two ranked by market share nationally (*NAT#*1), the *office* is the top ranked by city-industry market share (*CITY#1*), the *audit partner* is the top-ranked by market share nationally (*PARNAT#6*), and the *audit partner* is not the top-ranked by city-industry market share (*PARCITY#0*), and zero otherwise;
NAT#1-CITY#1_PARNAT#0-PARCITY#0	113	Indicator variable = 1 if the *audit firm* is the top-ranked by market share nationally (*NAT#1*), the *office* is the top-ranked by city-industry market share (*CITY#1*), the *audit partner* is not the top-ranked by market share nationally (*PARNAT#0*), and the *audit partner* is not the top-ranked by city-industry market share (*PARCITY#0*), and zero otherwise;
NAT#1-CITY#0_PARNAT#1-PARCITY#0	0	Indicator variable = 1 if the *audit firm* is the top-ranked by market share nationally (*NAT#1*), the *office* is not the top-ranked by city-industry market share (*CITY#0*), the *audit partner* is the top-ranked by market share nationally (*PARNAT#1*), and the *audit partner* is not the top-ranked by city-industry market share (*PARCITY#0*), and zero otherwise;
NAT#1-CITY#0_PARNAT#0-PARCITY#0	36	Indicator variable = 1 if the *audit firm* is the top-ranked by market share nationally (*NAT#1*), the *office* is not the top-ranked by city-industry market share (*CITY#0*), the *audit partner* is not the top-ranked by market share nationally (*PARNAT#0*), and the *audit partner* is not the top-ranked by city-industry market share (*PARCITY#0*), and zero otherwise;
NAT#0-CITY#1_PARNAT#1-PARCITY#0	0	Indicator variable = 1 if the *audit firm* is not the top-ranked by market share nationally (*NAT#0*), the *office* is the top-ranked by city-industry market share (*CITY#1*), the *audit partner* is the top-ranked by market share nationally (*PARNAT#1*), and the *audit partner* is not the top-ranked by city-industry market share (*PARCITY#0*), and zero otherwise;
NAT#0-CITY#1_PARNAT#0-PARCITY#0	26	Indicator variable = 1 if the *audit firm* is not the top-ranked by market share nationally (*NAT#0*), the *office* is the top-ranked by city-industry market share (*CITY#1*), the *audit partner* is not the top-ranked by market share nationally (*PARNAT#0*), and the *audit partner* is not the top-ranked by city-industry market share (*PARCITY#0*), and zero otherwise;
NAT#0-CITY#0_PARNAT#1-PARCITY#0	0	Indicator variable = 1 if the *audit firm* is not the top-ranked by market share nationally (*NAT#0*), the *office* is not the top-ranked by city-industry market share (*CITY#0*), the *audit partner* is the top-ranked by market share nationally (*PARNAT#1*), and the *audit partner* is not the top-ranked by city-industry market share (*PARCITY#0*), and zero otherwise;

Table 10.13: *AEE* regression under joint firm-partner national-city framework

Variables	+/-	coef.	t-stat	p-value	sig.
Intercept		0.166	2.630	0.005	***
TA	+	-0.004	-0.510	0.305	
PYTAC	+	-0.011	-0.860	0.194	
DE	-	0.008	0.210	0.419	
GROWTH	+	-0.003	-0.360	0.358	
MB	+	0.000	0.260	0.396	
CFO	-	-0.028	-0.960	0.168	
LOSS	+	0.007	0.650	0.259	
ALTMAN	-	-0.009	-1.890	0.030	**
BLOCKOWN	+	0.001	0.250	0.400	
BIG4	-	-0.004	-0.220	0.414	
SECOND	-	-0.009	-0.570	0.284	
Industry Specialist Auditor					
NAT#1-CITY#1_PARNAT#1-PARCITY#1 (n=38)		-0.028	-1.860	0.063	*
NAT#1-CITY#1_PARNAT#0-PARCITY#1 (n=58)		0.011	0.510	0.607	
NAT#1-CITY#0_PARNAT#1-PARCITY#1 (n=0)					
NAT#1-CITY#0_PARNAT#1-PARCITY#1 (n=0)					
NAT#0-CITY#1_PARNAT#1-PARCITY#1 (n=1)		0.024	1.480	0.139	
NAT#0-CITY#1_PARNAT#0-PARCITY#1 (n=77)		-0.010	-0.710	0.476	
NAT#0-CITY#0_PARNAT#1-PARCITY#1 (n=0)					
NAT#0-CITY#0_PARNAT#0-PARCITY#1 (n=9)		-0.022	-0.700	0.482	
NAT#1-CITY#1_PARNAT#1-PARCITY#0 (n=0)					
NAT#1-CITY#1_PARNAT#0-PARCITY#0 (n=113)		-0.020	-2.090	0.037	**
NAT#1-CITY#0_PARNAT#1-PARCITY#0 (n=0)					
NAT#1-CITY#0_PARNAT#0-PARCITY#0 (n=36)		0.002	0.170	0.868	
NAT#0-CITY#1_PARNAT#1-PARCITY#0 (n=0)					
NAT#0-CITY#1_PARNAT#0-PARCITY#0 (n=26)		0.029	0.480	0.634	
NAT#0-CITY#0_PARNAT#1-PARCITY#0 (n=0)					
Corporate Governance					
BODFEM		0.011	1.750	0.080	*
BODFOREIGN		0.002	0.350	0.726	
INTAUD		-0.013	-1.150	0.252	
ACSIZE		-0.004	-0.780	0.433	
ACINDP		0.015	2.460	0.014	**
ACFINEXP		-0.003	-0.520	0.606	
ACMEET		-0.001	-0.240	0.810	
Year fixed-effects			Included		
Industry fixed-effects			Included		
R^2			0.087		
N			824		

*** are significant at p<0.01, ** are significant at p<0.05 and *at p<0.10. All p-values are one-tailed, except for the industry specialist auditor variables and the corporate governance variables which are two-tailed. Industry fixed-effects and year fixed-effects are not reported for brevity, and t-statistics and significance levels are calculated using the White (1980) robust standard errors to correct for heteroscedasticity. Refer Table 5.8 for definition of variables.

between female directorship and accruals quality. Other corporate governance variables *BODFOREIGN*, *INTAUD*, *ACSIZE*, *ACFINEXP* and *ACMEET* are not significant at any conventional level.

For the control variables, only *ALTMAN* is negative and significant at p<0.01, similar to Reichelt and Wang (2010) and Minutti-Meza (2013), which shows that accrual estimation error is larger for firms with higher bankruptcy risk (*ALTMAN*)[25]. Other control variables, *TA*, *PYTAC*, *DE*, *GROWTH*, *MB*, *CFO*, *LOSS*, *BLOCKOWN*, *BIG4* and *SECOND*, are not significant at any conventional level.

[25] The Altman score measures the likelihood of a company survival. Lower (higher) scores measure greater (lesser) bankruptcy risk. Thus, negative association is expected between accrual estimation error and Altman.

10.2.3.3 Likelihood to report a profit / (avoid a loss) (*PROFIT*)

For the results in Table 10.15 below, the coding for the joint firm-partner industry leadership is derived based on analysis from Table 10.4 and Table 10.8, where the firm industry leadership is based on the combination of the top three ranked national industry leaders and the top-ranked city industry leader, whereas the partner industry leadership is based on the combination of the top-ranked national industry leader and the top-ranked city industry leader. The R^2 is 38 percent and is significant at $p<0.01$. The definition for the industry specialist auditor variables under the joint firm-partner national-city framework is provided in Table 10.14 below. Given that the sample size for the joint firm-partner national-city framework is N=680, then the default group is N=77 and is comprised of both audit firms and partners who are not leaders either at the national or city-industry level.

For the joint firm-partner national-city framework tests in Table 10.14, only one industry specialist auditor variable is significant. *NAT#3-CITY#1_PARNAT#0-PARCITY#1* is negative and significant (coefficient= -0.022, $p<0.10$), suggesting that combined joint leadership of the firm and the city partner is associated with a higher likelihood of reporting a loss rather than a profit.

In respect of the corporate governance variables in Table 10.15, none of the variables are significant at any conventional level, consistent with the earlier reported results under the firm national-city framework (Table 10.4) and partner national-city framework (Table 10.8) analyses. Control variables *TA*, *TAC*, *GROWTH*, *MB*, *CFO*, *LAG_LOSS* and *ALTMAN* are significant, suggesting that companies that are larger in size, have lower accruals, higher growth, lower operating cash flows, have experienced loss in the prior year and have a higher risk of bankruptcy are more likely to report a profit rather than a loss (Francis *et al.*, 2013).

Table 10.14: Definition of industry specialist auditor variables under the joint firm-partner national-city framework for *PROFIT* analysis

Variable	***N***	**Variable definition**
NAT#3-CITY#1_PARNAT#1-PARCITY#1	39	Indicator variable = 1 if the *audit firm* is in the top three ranked by market share nationally (*NAT#3*), the *office* is the top-ranked by city-industry market share (*CITY#1*), the *audit partner* is the top-ranked by market share nationally (*PARNAT#1*), and the *audit partner* is the top-ranked by city-industry market share (*PARCITY#1*), and zero otherwise;
NAT#3-CITY#1_PARNAT#0-PARCITY#1	119	Indicator variable = 1 if the *audit firm* is in the top three ranked by market share nationally (*NAT#3*), the *office* is the top-ranked by city-industry market share (*CITY#1*), the *audit partner* is not the top-ranked by market share nationally (*PARNAT#0*), and the *audit partner* is the top-ranked by city-industry market share (*PARCITY#1*), and zero otherwise;
NAT#3-CITY#0_PARNAT#1-PARCITY#1	0	Indicator variable = 1 if the *audit firm* is in the top three ranked by market share nationally (*NAT#3*), the *office* is not the top-ranked by city-industry market share (*CITY#0*), the *audit partner* is the top-ranked by market share nationally (*PARNAT#1*), and the *audit partner* is the top-ranked by city-industry market share (*PARCITY#1*), and zero otherwise;
NAT#3-CITY#0_PARNAT#0-PARCITY#1	4	Indicator variable = 1 if the *audit firm* is in the top three ranked by market share nationally (*NAT#3*), the *office* is not the top-ranked by city-industry market share (*CITY#0*), the *audit partner* is not the top-ranked by market share nationally (*PARNAT#0),* and the *audit partner* is the top-ranked by city-industry market share (*PARCITY#1*), and zero otherwise;
NAT#0-CITY#1_PARNAT#1-PARCITY#1	0	Indicator variable = 1 if the *audit firm* is not in the top three ranked by market share nationally (*NAT#0*), the *office* is the top-ranked by city-industry market share (*CITY#1*), the *audit partner* is the top-ranked by market share nationally (*PARNAT#1*), and the *audit partner* is the top-ranked by city-industry market share (*PARCITY#1*), and zero otherwise;
NAT#0-CITY#1_PARNAT#0-PARCITY#1	16	Indicator variable = 1 if the *audit firm* is not in the top three ranked by market share nationally (*NAT#0*), the *office* is the top-ranked by city-industry market share (*CITY#1*), the *audit partner* is not the top-ranked by market share nationally (*PARNAT#0*), and the *audit partner* is the top-ranked by city-industry market share (*PARCITY#1*), and zero otherwise;
NAT#0-CITY#0_PARNAT#1-PARCITY#1	0	Indicator variable = 1 if the *audit firm* is not in the top three ranked by market share nationally (*NAT#0*), the *office* is not the top-ranked by city-industry market share (*CITY#0*), the *audit partner* is the top-ranked by market share nationally (*PARNAT#1*), and the *audit partner* is the top-ranked by city-industry market share (*PARCITY#1*), and zero otherwise;
NAT#0-CITY#0_PARNAT#0-PARCITY#1	5	Indicator variable = 1 if the *audit firm* is not in the top three ranked by market share nationally (*NAT#0*), the *office* is not the top-ranked by city-industry market share (*CITY#0*), the *audit partner* is not the top-ranked by

		market share nationally (*PARNAT#0*), and the *audit partner* is the top-ranked by city-industry market share (*PARCITY#1*), and zero otherwise;
NAT#3-CITY#1_PARNAT#1-PARCITY#0	0	Indicator variable = 1 if the *audit firm* is in the top three ranked by market share nationally (*NAT#*3), the *office* is the top-ranked by city-industry market share (*CITY#1*), the *audit partner* is the top-ranked by market share nationally (*PARNAT#6*), and the *audit partner* is not the top-ranked by city-industry market share (*PARCITY#0*), and zero otherwise;
NAT#3-CITY#1_PARNAT#0-PARCITY#0	134	Indicator variable = 1 if the *audit firm* is in the top three ranked by market share nationally (*NAT#3*), the *office* is the top-ranked by city-industry market share (*CITY#1*), the *audit partner* is not the top-ranked by market share nationally (*PARNAT#0*), and the *audit partner* is not the top-ranked by city-industry market share (*PARCITY#0*), and zero otherwise;
NAT#3-CITY#0_PARNAT#1-PARCITY#0	0	Indicator variable = 1 if the *audit firm* is in the top three ranked by market share nationally (*NAT#3*), the *office* is not the top-ranked by city-industry market share (*CITY#0*), the *audit partner* is the top-ranked by market share nationally (*PARNAT#1*), and the *audit partner* is not the top-ranked by city-industry market share (*PARCITY#0*), and zero otherwise;
NAT#3-CITY#0_PARNAT#0-PARCITY#0	276	Indicator variable = 1 if the *audit firm* is in the top three ranked by market share nationally (*NAT#3*), the *office* is not the top-ranked by city-industry market share (*CITY#0*), the *audit partner* is not the top-ranked by market share nationally (*PARNAT#0*), and the *audit partner* is not the top-ranked by city-industry market share (*PARCITY#0*), and zero otherwise;
NAT#0-CITY#1_PARNAT#1-PARCITY#0	0	Indicator variable = 1 if the *audit firm* is not in the top three ranked by market share nationally (*NAT#0*), the *office* is the top-ranked by city-industry market share (*CITY#1*), the *audit partner* is the top-ranked by market share nationally (*PARNAT#1*), and the *audit partner* is not the top-ranked by city-industry market share (*PARCITY#0*), and zero otherwise;
NAT#0-CITY#1_PARNAT#0-PARCITY#0	5	Indicator variable = 1 if the *audit firm* is not in the top three ranked by market share nationally (*NAT#0*), the *office* is the top-ranked by city-industry market share (*CITY#1*), the *audit partner* is not the top-ranked by market share nationally (*PARNAT#0*), and the *audit partner* is not the top-ranked by city-industry market share (*PARCITY#0*), and zero otherwise;
NAT#0-CITY#0_PARNAT#1-PARCITY#0	0	Indicator variable = 1 if the *audit firm* is not in the top three ranked by market share nationally (*NAT#0*), the *office* is not the top-ranked by city-industry market share (*CITY#0*), the *audit partner* is the top-ranked by market share nationally (*PARNAT#1*), and the *audit partner* is not the top-ranked by city-industry market share (*PARCITY#0*), and zero otherwise;

Table 10.15: *PROFIT* Regression under joint firm-partner national-city framework

Variables	+/-	coef.	t-stat	p-value	sig.
Intercept		-1.026	-1.220	0.112	
TA	+	0.180	1.650	0.050	*
LEV	+	0.077	0.180	0.429	
TAC	-	-1.867	-3.140	0.001	***
GROWTH	+	0.129	1.520	0.065	*
MB	+	0.018	1.440	0.075	*
CFO	-	2.533	3.770	0.000	***
LAG LOSS	+	-0.787	-6.590	0.000	***
ALTMAN	-	0.240	2.790	0.003	***
BLOCKOWN	+	-0.009	-0.150	0.441	
BIG4	-	0.245	0.990	0.160	
SECOND	-	0.083	0.510	0.307	
Industry Specialist Auditor					
NAT#3-CITY#1_PARNAT#1-PARCITY#1 (n=39)		-0.116	-0.320	0.752	
NAT#3-CITY#1_PARNAT#0-PARCITY#1 (n=119)		-0.675	-2.580	0.010	**
NAT#3-CITY#0_PARNAT#1-PARCITY#1 (n=0)					
NAT#3-CITY#0_PARNAT#0-PARCITY#1 (n=4)					
NAT#0-CITY#1_PARNAT#1-PARCITY#1 (n=0)					
NAT#0-CITY#1_PARNAT#0-PARCITY#1 (n=16)		0.702	1.490	0.137	
NAT#0-CITY#0_PARNAT#1-PARCITY#1 (n=0)					
NAT#0-CITY#0_PARNAT#0-PARCITY#1 (n=5)					
NAT#3-CITY#1_PARNAT#1-PARCITY#0 (n=0)					
NAT#3-CITY#1_PARNAT#0-PARCITY#0 (n=139)		-0.398	-1.640	0.100	
NAT#3-CITY#0_PARNAT#1-PARCITY#0 (n=0)					
NAT#3-CITY#0_PARNAT#0-PARCITY#0 (n=276)		-0.271	-1.220	0.222	
NAT#0-CITY#1_PARNAT#1-PARCITY#0 (n=0)					
NAT#0-CITY#1_PARNAT#0-PARCITY#0 (n=5)					
NAT#0-CITY#0_PARNAT#1-PARCITY#0 (n=0)					
Corporate Governance					
BODFEM		-0.007	-0.090	0.926	
BODFOREIGN		-0.075	-1.120	0.264	
INTAUD		0.168	1.160	0.248	
ACSIZE		-0.001	-0.020	0.985	
ACINDP		0.002	0.020	0.983	
ACFINEXP		0.020	0.340	0.731	
ACMEET		-0.030	-0.440	0.659	
Year fixed-effects			Included		
Industry fixed-effects			Included		
R^2			0.380		
N			1,019		

*** are significant at p<0.01, ** are significant at p<0.05 and *at p<0.10. All p-values are one-tailed, except for the industry specialist auditor variables and the corporate governance variables which are two-tailed. Industry fixed-effects and year fixed-effects are not reported for brevity, and t-statistics and significance levels are calculated using the White (1980) robust standard errors to correct for heteroscedasticity. Refer Table 5.8 for definition of variables.

10.3 Summary

The findings from the second empirical study suggest that audit firm industry leadership plays a more important role than audit partner industry leadership in promoting higher earnings quality, as evidenced by lower discretionary accruals, lower accrual estimation error and higher likelihood of reporting a loss rather than a profit. The finding on auditor industry specialisation seems to support the product differentiation theory and reputation theory, given the consistent evidence between fee premium and higher earnings quality offered by industry specialist auditors. In addition, the study also finds that the audit committee's financial expertise and independence contribute to accruals manipulation through larger magnitude of discretionary accruals and higher accrual estimation error. This finding is interesting given the data is tested in the period following the 2007/2008 financial crisis, suggesting that the corporate governance mechanisms is not effective in constraining earnings management, but somehow the effect is moderated by the role of industry specialist auditor. In addition, the study also finds that the female directors, audit committee independence, and audit committee's accounting or financial expertise contribute to accruals manipulation. Findings for the corporate governance analyses are consistent with institutional theory or managerial hegemony theory, where the role of board is viewed to be passive and more of ceremonial in nature during the sample period investigated, as there is no evidence to suggest that they effectively constrain the earnings management practices in the U.K. public listed companies.

The results from the multivariate analyses are summarised in Table 10.16 below.

Table 10.16: Summary of findings from multivariate analysis for the second empirical study

Hypotheses		**DAC_PERF Findings**	**AEE Findings**	**PROFIT Findings**
H2	There is no significant relationship between the female directors on boards and earnings quality.	Not significant.	Significant negative relationship.	Not significant.
H4	There is no significant relationship between foreign directors on boards and earnings quality.	Not significant.	Not significant.	Not significant.
H6	There is no significant relationship between the internal audit function and earnings quality.	Not significant	Not significant.	Not significant.
H8	There is no significant relationship between the size of audit committees and earnings quality.	Not significant.	Not significant.	Not significant.
H10	There is no significant relationship between audit committee independence and earnings quality.	Not significant.	Significant negative relationship.	Not significant.
H12	There is no significant relationship between audit committee financial expertise and earnings quality.	Significant negative relationship.	Not significant.	Not significant.
H14	There is no relationship between audit committee diligence and earnings quality.	Not significant.	Not significant.	Not significant.
H16	There is no significant relationship between auditor industry leadership and earnings quality.	Significant positive relationship.	Significant positive relationship.	Significant positive relationship.

CHAPTER 11

FURTHER ANALYSIS AND ROBUSTNESS TESTS: THE EFFECT OF INDUSTRY SPECIALIST AUDITORS AND CORPORATE GOVERNANCE ON EARNINGS QUALITY

11.1 Introduction

Several tests are performed after the multivariate regression analysis in Chapter 10. The purpose of these additional tests is to provide reasonable assurance that the main findings in Chapter 10 are robust to the various models and variables specifications. The robustness tests include tests using different regression estimators, alternative measures for audit firm industry specialist, moderating effect of competitive pressure on audit firm industry specialist ability in constraining earnings management, continuous measure of industry specialist, moderating effect of gender and tenure on audit partner industry expertise ability in constraining earnings management, endogenous relationship between industry specialist auditor and corporate governance and earnings quality, various alternative fixed-effects models, and alternative definitions of corporate governance characteristics. Overall, these robustness tests presented in the following sections of this chapter provide additional empirical evidence on the main conclusions reached in the last chapter.

11.2 Alternative regression estimator

In this section, the various earnings quality regressions that have been carried out using the OLS in the main analysis are being re-estimated using alternative regression estimators; i) one-way cluster robust standard error clustering for the firm dimension, and ii) two-way cluster robust standard error, clustering for both the firm and time dimensions. This sensitivity analysis is the same as the one that have been carried out for the audit fees analysis in Section 8.2 earlier.

For the *DAC_PERF* model, the test results for the industry specialist auditor variables in Table 11.1 below are consistent with the results reported in the main analysis using OLS in Chapter 10 earlier, where the audit firm industry leadership matters more than the partner industry leadership in reducing the *AEE*. Whereas for the corporate governance variables, findings are consistent throughout all the models as per the main analyses, where only *ACFINEXP* is significant and positive, suggesting that the accruals manipulation is higher when the audit committee comprised of more members with accounting or financial background or qualification. Other corporate governance variables are not significant at any conventional levels.

For the *AEE* model, the test results for the industry specialist auditor variables in Table 11.2 below are consistent with the results reported in the main analysis using OLS in Chapter 10 earlier, where the audit firm industry leadership matters more than the partner industry leadership in reducing the *AEE*. Whereas for the corporate governance variables, findings are consistent throughout all the models as per the main analyses, where *BODFEM* is significant and positive, suggesting that the accruals estimation error is higher when the board comprised of more female directors on board. However, when two-way robust cluster standard error is used for the analysis, *BODFEM* is also significant. Other corporate governance variables are not significant at any conventional levels.

For the *PROFIT* model, the test results for the industry specialist auditor variables in Table 11.3 below inconsistent with the results reported in the main analysis using OLS in Chapter 10 earlier, as there is also evidence that partners who are industry leaders at the city level are more conservative in their profit reporting. On the other hand, results from the main analysis indicate that the audit firm firm industry leadership matters more than the partner industry leadership in conservative profit reporting. Whereas for the corporate governance variables, findings are consistent throughout all the models as per the main analyses when one-way cluster robust standard error is used, as none of the corporate governance variables seemed to be significant at any conventional level. However, when two-way cluster robust standard error is used as the regression estimator, *BODFOREIGN* and *INTAUD* turned out to be significant at $p<0.01$ when the partner industry leadership is controlled for in Model 2 and Model 3. Other corporate governance variables remain insignificant at the conventional levels.

Taken together, it seems that the main analyses results from using OLS are only consistent with the one-way cluster robust standard error is used, clustering for time dimension. However, when both time and firm dimension are being clustered for using the two-way cluster robust standard error, some results in the *AEE* and *PROFIT* analyses which were insignificant in the main analyses have now become significant.

Table 11.1: *DAC_PERF* Regression using different regression estimators

		Panel A: One-way cluster robust standard error									Panel B: Two-way cluster robust standard error								
		Model 1			Model 2			Model 3			Model 1			Model 2			Model 3		
Variables	**+/-**	**coef.**	**t-stat**	**sig.**	**coef.**	**t-stat**	**sig.**	**coef.**	**t-stat**	**sig.**	**coef.**	**t-stat**	**sig.**	**coef.**	**t-stat**	**sig.**	**coef.**	**t-stat**	**sig.**
Intercept		0.101	1.510	0.066*	0.127	1.600	0.055*	0.120	1.500	0.067*	0.101	2.010	0.023**	0.127	2.230	0.013****	0.120	1.740	0.041**
TA	+	0.002	0.220	0.414	-0.004	-0.340	0.369	-0.002	-0.230	0.411	0.002	0.250	0.402	-0.004	-0.490	0.313	-0.002	-0.270	0.393
PYTAC	+	0.023	1.360	0.087*	0.024	0.980	0.164	0.024	0.950	0.172	0.023	1.830	0.034**	0.024	1.600	0.055*	0.024	1.480	0.070*
DE	-	-0.058	-2.310	0.011**	-0.047	-1.650	0.050*	-0.048	-1.710	0.045**	-0.058	-2.520	0.006***	-0.047	-1.620	0.053*	-0.048	-2.380	0.009***
GROWTH	+	0.003	0.510	0.305	-0.005	-0.570	0.285	-0.005	-0.580	0.281	0.003	0.320	0.375	-0.005	-0.410	0.343	-0.005	-0.450	0.326
MB	+	0.002	1.580	0.058*	0.002	1.420	0.078*	0.002	1.330	0.092*	0.002	3.380	0.001***	0.002	3.310	0.001***	0.002	2.970	0.002***
CFO	-	-0.180	-2.910	0.002***	-0.197	-2.680	0.004***	-0.204	-2.740	0.004***	-0.180	-2.400	0.009***	-0.197	-2.440	0.008***	-0.204	-2.570	0.005***
LOSS	+	0.005	0.260	0.396	0.011	0.530	0.299	0.012	0.550	0.291	0.005	0.230	0.409	0.011	0.480	0.314	0.012	0.490	0.311
ALTMAN	-	-0.003	-0.430	0.335	-0.002	-0.240	0.405	-0.002	-0.190	0.426	-0.003	-0.510	0.306	-0.002	-0.360	0.358	-0.002	-0.280	0.389
BLOCKOWN	+	-0.003	-0.550	0.291	-0.002	-0.230	0.408	-0.002	-0.190	0.425	-0.003	-0.410	0.343	-0.002	-0.160	0.437	-0.002	-0.130	0.447
BIG4	-	-0.013	-0.680	0.248	-0.026	-1.220	0.111	-0.011	-0.470	0.321	-0.013	-0.470	0.320	-0.026	-0.930	0.177	-0.011	-0.310	0.378
SECOND	-	-0.043	-2.190	0.015**	-0.044	-1.980	0.024**	-0.045	-2.000	0.024**	-0.043	-1.640	0.050*	-0.044	-1.270	0.103	-0.045	-1.300	0.098*
Industry Specialist Auditor																			
Firm national-city framework																			
JOINT_NAT#2-CITY#1 (n=337)		-0.030	-2.650	0.008***							-0.030	-2.010	0.045**						
CITY#1_ONLY (n=64)		-0.008	-0.540	0.592							-0.008	-0.370	0.709						
NAT#2_ONLY (n=234)		-0.021	-1.720	0.086*							-0.021	-2.020	0.044**						
Partner national-city framework																			
PARJOINT_PARTNAT#1-PARCITY#1 (n=39)					-0.019	-1.180	0.239							-0.019	-0.960	0.335			
PARCITY_ONLY (n=139)					-0.006	-0.540	0.587							-0.006	-0.740	0.461			
PARTNAT#1_ONLY(n=0)																			
Joint firm-partner national-city framework																			
NAT#2-CITY#1_PARNAT#1-PARCITY#1 (n=39)								-0.036	-1.740	0.082*							-0.036	-1.460	0.145
NAT#2-CITY#1_PARNAT#0-PARCITY#1 (n=93)								-0.032	-1.920	0.056*							-0.032	-2.760	0.006***
NAT#2-CITY#0_PARNAT#1-PARCITY#1 (n=0)																			
NAT#2-CITY#0_PARNAT#0-PARCITY#1 (n=2)								-0.022	-0.350	0.723							-0.022	-0.490	0.621
NAT#0-CITY#1_PARNAT#1-PARCITY#1 (n=0)																			
NAT#0-CITY#1_PARNAT#0-PARCITY#1 (n=42)								-0.001	-0.060	0.953							-0.001	-0.040	0.972
NAT#0-CITY#0_PARNAT#1-PARCITY#1 (n=0)																			
NAT#0-CITY#0_PARNAT#0-PARCITY#1 (n=7)								-0.037	-1.630	0.104							-0.037	-4.000	0.000***
NAT#2-CITY#1_PARNAT#1-PARCITY#0 (n=0)																			
NAT#2-CITY#1_PARNAT#0-PARCITY#0 (n=131)								-0.030	-1.770	0.077*							-0.030	-1.140	0.256
NAT#2-CITY#0_PARNAT#1-PARCITY#0 (n=0)																			
NAT#2-CITY#0_PARNAT#0-PARCITY#0 (n=185)								-0.020	-1.300	0.196							-0.020	-1.580	0.114
NAT#0-CITY#1_PARNAT#1-PARCITY#0 (n=0)																			
NAT#0-CITY#1_PARNAT#0-PARCITY#0 (n=8)								-0.074	-2.310	0.021**							-0.074	-2.970	0.003***
NAT#0-CITY#0_PARNAT#1-PARCITY#0 (n=0)																			
Corporate Governance																			
BODFEM		0.004	0.830	0.408	0.007	1.400	0.163	0.008	1.500	0.135	0.004	0.560	0.575	0.007	0.840	0.403	0.008	0.960	0.338
BODFOREIGN		0.009	1.420	0.156	0.007	1.040	0.300	0.007	1.020	0.307	0.009	1.770	0.077*	0.007	1.580	0.116	0.007	1.390	0.165
INTAUD		-0.012	-1.130	0.257	-0.003	-0.210	0.834	-0.002	-0.140	0.887	-0.012	-1.090	0.277	-0.003	-0.240	0.813	-0.002	-0.150	0.884
ACSIZE		-0.005	-1.000	0.318	-0.007	-1.080	0.280	-0.007	-1.040	0.300	-0.005	-1.330	0.183	-0.007	-1.340	0.179	-0.007	-1.120	0.263
ACINDP		-0.001	-0.150	0.881	-0.003	-0.210	0.831	-0.002	-0.200	0.844	-0.001	-0.330	0.745	-0.003	-0.690	0.491	-0.002	-0.550	0.584

Table 11.1: DAC_PERF Regression using different regression estimators (continued)

		Panel A: One-way cluster robust standard error									Panel B: Two-way cluster robust standard error								
		Model 1			Model 2			Model 3			Model 1			Model 2			Model 3		
Variables	**+/-**	**coef.**	**t-stat**	**sig.**	**coef.**	**t-stat**	**sig.**	**coef.**	**t-stat**	**sig.**	**coef.**	**t-stat**	**sig.**	**coef.**	**t-stat**	**sig.**	**coef.**	**t-stat**	**sig.**
ACFINEXP		0.008	2.030	0.043**	0.011	2.270	0.024**	0.012	2.390	0.017**	0.008	2.240	0.025**	0.011	3.540	0.000***	0.012	3.840	0.000***
ACMEET		-0.006	-0.890	0.373	-0.002	-0.320	0.747	-0.003	-0.460	0.648	-0.006	-1.090	0.276	-0.002	-0.400	0.690	-0.003	-0.560	0.576
Year fixed-effects			Included			Included			Included			Included			Included			Included	
Industry fixed-effects			Included			Included			Included			Included			Included			Included	
Cluster by Year			No			No			No			Yes			Yes			Yes	
Cluster by Firm			Yes			Yes			Yes			Yes			Yes			Yes	
R^2			0.214			0.229			0.232			0.214			0.229			0.232	
N			1,347			1,019			1,019			1,347			1,019			1,019	

*** are significant at p<0.01, ** are significant at p<0.05 and *at p<0.10. All p-values are one-tailed, except for the industry specialist auditor variables and the corporate governance variables which are two-tailed. Industry fixed-effects and year fixed-effects are not reported for brevity. Refer Table 5.8 for definition of variables.

Table 11.2: *AEE* Regression using different regression estimators

		One-way cluster robust standard error									Two-way cluster robust standard error								
		Model 1			Model 2			Model 3			Model 1			Model 2			Model 3		
Variables	**+/-**	**coef.**	**t-stat**	**sig.**	**coef.**	**t-stat**	**sig.**	**coef.**	**t-stat**	**sig.**	**coef.**	**t-stat**	**sig.**	**coef.**	**t-stat**	**sig.**	**coef.**	**t-stat**	**sig.**
Intercept		0.135	1.930	0.027**	0.170	2.790	0.003***	0.166	2.680	0.004***	0.135	1.880	0.030**	0.170	8.230	0.000***	0.166	6.460	0.000***
TA	+	0.002	0.250	0.404	-0.005	-0.610	0.273	-0.004	-0.520	0.302	0.002	0.260	0.398	-0.005	-1.190	0.118	-0.004	-0.910	0.182
PYTAC	+	-0.003	-0.300	0.384	-0.011	-0.840	0.202	-0.011	-0.870	0.193	-0.003	-0.440	0.329	-0.011	-1.250	0.105	-0.011	-1.270	0.103
DE	-	-0.040	-1.100	0.136	0.006	0.190	0.426	0.008	0.220	0.414	-0.040	-0.700	0.244	0.006	0.120	0.453	0.008	0.140	0.445
GROWTH	+	0.008	0.800	0.211	-0.003	-0.290	0.387	-0.003	-0.350	0.363	0.008	1.080	0.141	-0.003	-0.260	0.398	-0.003	-0.320	0.373
MB	+	0.000	0.410	0.343	0.000	0.230	0.408	0.000	0.250	0.401	0.000	0.580	0.280	0.000	0.340	0.369	0.000	0.370	0.357
CFO	-	-0.048	-1.620	0.053*	-0.031	-0.980	0.165	-0.028	-0.910	0.181	-0.048	-1.700	0.045**	-0.031	-1.060	0.145	-0.028	-0.870	0.192
LOSS	+	0.024	1.820	0.035**	0.008	0.830	0.203	0.007	0.650	0.259	0.024	1.380	0.085*	0.008	0.810	0.210	0.007	0.630	0.265
ALTMAN	-	-0.013	-2.570	0.006***	-0.008	-1.740	0.041**	-0.009	-1.930	0.027**	-0.013	-2.740	0.003***	-0.008	-2.610	0.005***	-0.009	-2.550	0.006***
BLOCKOWN	+	0.003	0.700	0.241	0.001	0.240	0.407	0.001	0.260	0.397	0.003	0.630	0.264	0.001	0.150	0.439	0.001	0.180	0.429
BIG4	-	-0.001	-0.030	0.487	-0.004	-0.260	0.399	-0.004	-0.220	0.413	-0.001	-0.070	0.471	-0.004	-0.400	0.346	-0.004	-0.370	0.355
SECOND	-	-0.024	-1.670	0.048**	-0.009	-0.580	0.281	-0.009	-0.610	0.273	-0.024	-1.580	0.057*	-0.009	-1.830	0.034**	-0.009	-1.860	0.032**
Industry Specialist Auditor																			
Firm national-city framework																			
JOINT_NAT#1-CITY#1 (n=251)		-0.020	-1.820	0.070*							-0.020	-2.450	0.014**						
CITY#1_ONLY (n=112)		0.003	0.170	0.865							0.003	0.150	0.877						
NAT#1_ONLY (n=38)		-0.004	-0.300	0.766							-0.004	-0.650	0.515						
Partner national-city framework																			
PARJOINT_PARNAT#1-PARCITY (n=39)					-0.022	-1.480	0.140							-0.022	-1.710	0.088*			
PARCITY#1_ONLY (n=123)					0.000	0.020	0.982							0.000	0.020	0.987			
PARNAT#1_ONLY (n=0)																			
Joint firm-partner national-city framework																			
NAT#1-CITY#1_PARNAT#1-PARCITY#1 (n=38)								-0.028	-1.690	0.092*							-0.028	-2.250	0.025**
NAT#1-CITY#1_PARNAT#0-PARCITY#1 (n=58)								0.011	0.540	0.588							0.011	0.600	0.546
NAT#1-CITY#0_PARNAT#1-PARCITY#1 (n=0)																			
NAT#1-CITY#0_PARNAT#1-PARCITY#1 (n=0)																			
NAT#0-CITY#1_PARNAT#1-PARCITY#1 (n=1)								0.024	1.430	0.154							0.024	4.400	0.000***
NAT#0-CITY#1_PARNAT#0-PARCITY#1 (n=77)								-0.010	-0.760	0.447							-0.010	-0.410	0.679
NAT#0-CITY#0_PARNAT#1-PARCITY#1 (n=0)																			
NAT#0-CITY#0_PARNAT#0-PARCITY#1 (n=9)								-0.022	-0.780	0.438							-0.022	0.000	0.999
NAT#1-CITY#1_PARNAT#1-PARCITY#0 (n=0)																			
NAT#1-CITY#1_PARNAT#0-PARCITY#0 (n=113)								-0.020	-2.260	0.024**							-0.020	-4.370	0.000***
NAT#1-CITY#0_PARNAT#1-PARCITY#0 (n=0)																			
NAT#1-CITY#0_PARNAT#0-PARCITY#0 (n=36)								0.002	0.150	0.881							0.002	0.310	0.758
NAT#0-CITY#1_PARNAT#1-PARCITY#0 (n=0)																			
NAT#0-CITY#1_PARNAT#0-PARCITY#0 (n=26)								0.029	0.460	0.647							0.029	0.790	0.432
NAT#0-CITY#0_PARNAT#1-PARCITY#0 (n=0)																			
Corporate Governance																			
BODFEM		0.007	1.310	0.190	0.010	1.490	0.137	0.011	1.640	0.102	0.007	2.210	0.027**	0.010	3.630	0.000***	0.011	4.300	0.000***
BODFOREIGN		0.003	0.560	0.574	0.002	0.400	0.693	0.002	0.380	0.706	0.003	0.670	0.501	0.002	0.430	0.667	0.002	0.480	0.635
INTAUD		-0.013	-1.270	0.205	-0.014	-1.280	0.201	-0.013	-1.200	0.230	-0.013	-2.440	0.015	-0.014	-1.500	0.134	-0.013	-1.440	0.150
ACSIZE		0.003	0.440	0.659	-0.004	-0.810	0.417	-0.004	-0.790	0.427	0.003	0.360	0.716	-0.004	-0.580	0.562	-0.004	-0.530	0.596
ACINDP		0.012	1.650	0.100	0.015	2.770	0.006***	0.015	2.660	0.008***	0.012	2.160	0.031**	0.015	2.370	0.018**	0.015	2.280	0.023**
ACFINEXP		-0.003	-0.690	0.491	-0.003	-0.530	0.594	-0.003	-0.550	0.580	-0.003	-0.480	0.632	-0.003	-0.400	0.688	-0.003	-0.370	0.708

Table 11.2: *AEE* Regression using different regression estimators (continued)

		One-way cluster robust standard error									Two-way cluster robust standard error								
		Model 1			Model 2			Model 3			Model 1			Model 2			Model 3		
Variables	**+/-**	**coef.**	**t-stat**	**sig.**	**coef.**	**t-stat**	**sig.**	**coef.**	**t-stat**	**sig.**	**coef.**	**t-stat**	**sig.**	**coef.**	**t-stat**	**sig.**	**coef.**	**t-stat**	**sig.**
ACMEET		-0.008	-0.750	0.452	0.000	-0.090	0.930	-0.001	-0.240	0.810	-0.008	-1.030	0.304	0.000	-0.180	0.857	-0.001	-0.390	0.693
Year fixed-effects			Included			Included			Included			Included			Included			Included	
Industry fixed-effects			Included			Included			Included			Included			Included			Included	
Cluster by Year			No			No			No			Yes			Yes			Yes	
Cluster by Firm			Yes			Yes			Yes			Yes			Yes			Yes	
R^2			0.116			0.081			0.087			0.116			0.081			0.087	
N			1,083			824			824			1,083			824			824	

*** are significant at p<0.01, ** are significant at p<0.05 and *at p<0.10. All p-values are one-tailed, except for the industry specialist auditor variables and the corporate governance variables which are two-tailed. Industry fixed-effects and year fixed-effects are not reported for brevity. Refer Table 5.8 for definition of variables.

Table 11.3: *PROFIT* Regression using different regression estimators

		One-way cluster robust standard error									Two-way cluster robust standard error								
		Model 1			Model 2			Model 3			Model 1			Model 2			Model 3		
Variables	**+/-**	**coef.**	**t-stat**	**sig.**	**coef.**	**t-stat**	**sig.**	**coef.**	**t-stat**	**sig.**	**coef.**	**t-stat**	**sig.**	**coef.**	**t-stat**	**sig.**	**coef.**	**t-stat**	**sig.**
Intercept		-0.369	-0.610	0.271	-0.841	-1.070	0.143	-0.880	-1.090	0.137	0.285	0.940	0.173	0.063	2.060	0.020**	0.120	0.440	0.332
TA	+	0.102	1.310	0.096*	0.173	1.690	0.046**	0.180	1.720	0.043**	0.042	1.170	0.121	0.063	2.060	0.020**	0.063	1.930	0.028**
LEV	+	-0.028	-0.080	0.467	0.086	0.220	0.415	0.077	0.190	0.426	0.032	0.340	0.367	0.055	0.430	0.333	0.052	0.410	0.340
TAC	-	-1.900	-3.870	0.000***	-1.770	-2.940	0.002***	-1.867	-3.100	0.001***	-0.058	-1.220	0.112	-0.038	-0.960	0.169	-0.040	-0.980	0.164
GROWTH	+	0.071	1.150	0.125	0.122	1.430	0.076*	0.129	1.490	0.068*	0.013	0.950	0.172	0.022	0.880	0.190	0.021	0.820	0.206
MB	+	0.020	1.740	0.041**	0.015	1.230	0.109	0.018	1.460	0.072*	0.002	0.950	0.172	0.001	0.570	0.284	0.001	0.700	0.241
CFO	-	2.394	3.890	0.000***	2.508	3.580	0.000***	2.533	3.520	0.000***	0.451	7.240	0.000***	0.429	9.330	0.000***	0.424	9.440	0.000***
LAG LOSS	+	-0.780	-7.460	0.000***	-0.788	-6.500	0.000***	-0.787	-6.500	0.000***	-0.289	-25.450	0.000***	-0.283	-16.240	0.000***	-0.281	-14.990	0.000***
ALTMAN	-	0.175	2.430	0.008***	0.233	2.760	0.003***	0.240	2.860	0.002***	0.061	3.970	0.000***	0.072	5.290	0.000***	0.075	5.800	0.000***
BLOCKOWN	+	-0.012	-0.240	0.404	-0.002	-0.040	0.486	-0.009	-0.150	0.440	0.001	0.230	0.409	0.004	0.730	0.234	0.002	0.370	0.355
BIG4	-	0.261	1.320	0.094*	-0.014	-0.080	0.468	0.245	0.970	0.167	0.060	1.370	0.086*	0.011	0.130	0.447	0.055	0.880	0.190
SECOND	-	0.193	1.420	0.078*	0.082	0.480	0.315	0.083	0.490	0.313	0.053	1.080	0.141	0.033	0.520	0.303	0.034	0.540	0.294
Industry Specialist Auditor																			
Firm national-city framework																			
JOINT_NAT#3-CITY#1 (n=374)		-0.384	-2.210	0.027**							-0.071	-1.920	0.055*						
CITY#1 ONLY (n=27)		0.486	1.130	0.260							0.086	1.610	0.107						
NAT#123 ONLY (n=359)		-0.234	-1.320	0.186							-0.041	-1.440	0.151						
Partner national-city framework																			
PARJOINT_PARNAT#1-PARCITY#1 (n=39)					0.153	0.590	0.556							0.033	0.690	0.489			
PARCITY#1 _ONLY (n=139)					-0.255	-1.600	0.109							-0.063	-1.850	0.065*			
PARNAT#1_ONLY (n=0)																			
Joint firm-partner national-city framework																			
NAT#3-CITY#1_PARNAT#1-PARCITY#1 (n=39)								-0.116	-0.360	0.720							-0.014	-0.220	0.827
NAT#3-CITY#1_PARNAT#0-PARCITY#1 (n=119)								-0.675	-2.580	0.010**							-0.145	-5.040	0.000***
NAT#3-CITY#0_PARNAT#1-PARCITY#1 (n=0)																			
NAT#3-CITY#0_PARNAT#0-PARCITY#1 (n=4)																	0.016	0.210	0.836
NAT#0-CITY#1_PARNAT#1-PARCITY#1 (n=0)																			
NAT#0-CITY#1_PARNAT#0-PARCITY#1 (n=16)								0.702	1.410	0.157							0.094	1.350	0.178
NAT#0-CITY#0_PARNAT#1-PARCITY#1 (n=0)																			
NAT#0-CITY#0_PARNAT#0-PARCITY#1 (n=5)																	0.050	0.620	0.538
NAT#3-CITY#1_PARNAT#1-PARCITY#0 (n=0)																			
NAT#3-CITY#1_PARNAT#0-PARCITY#0 (n=139)								-0.398	-1.600	0.109							-0.072	-1.140	0.255
NAT#3-CITY#0_PARNAT#1-PARCITY#0 (n=0)																			
NAT#3-CITY#0_PARNAT#0-PARCITY#0 (n=276)								-0.271	-1.160	0.247							-0.041	-1.060	0.290
NAT#0-CITY#1_PARNAT#1-PARCITY#0 (n=0)																			
NAT#0-CITY#1_PARNAT#0-PARCITY#0 (n=5)																	0.080	0.700	0.483
NAT#0-CITY#0_PARNAT#1-PARCITY#0 (n=0)																			
Corporate Governance																			
BODFEM		0.006	0.100	0.920	-0.002	-0.030	0.980	-0.007	-0.100	0.922	0.006	0.100	0.460	0.001	-0.030	0.490	0.002	-0.100	0.461
BODFOREIGN		-0.057	-1.010	0.314	-0.087	-1.380	0.169	-0.075	-1.190	0.234	-0.026	-1.010	0.157	-0.035	-1.380	0.000***	-0.032	-1.190	0.000***
INTAUD		0.172	1.450	0.147	0.176	1.270	0.206	0.168	1.210	0.227	0.055	2.620	0.009	0.054	2.730	0.006***	0.053	2.830	0.005***
ACSIZE		0.045	0.750	0.454	0.018	0.250	0.805	-0.001	-0.020	0.985	0.008	0.720	0.469	0.000	0.010	0.992	-0.001	-0.070	0.945
ACINDP		0.013	0.180	0.855	0.003	0.040	0.968	0.002	0.020	0.983	0.008	1.160	0.244	0.000	0.030	0.979	-0.001	-0.130	0.900
ACFINEXP		0.013	0.290	0.772	0.014	0.230	0.817	0.020	0.340	0.736	0.004	0.220	0.823	-0.002	-0.060	0.954	0.000	0.000	0.998

Table 11.3: *PROFIT* Regression using different regression estimators (continued)

		One-way cluster robust standard error									Two-way cluster robust standard error								
		Model 1			Model 2			Model 3			Model 1			Model 2			Model 3		
Variables	**+/-**	**coef.**	**t-stat**	**sig.**	**coef.**	**t-stat**	**sig.**	**coef.**	**t-stat**	**sig.**	**coef.**	**t-stat**	**sig.**	**coef.**	**t-stat**	**sig.**	**coef.**	**t-stat**	**sig.**
ACMEET		0.005	0.090	0.925	-0.031	-0.460	0.647	-0.030	-0.440	0.662	0.001	0.070	0.944	-0.008	-0.350	0.726	-0.008	-0.310	0.753
Year fixed-effects			Included			Included			Included			Included			Included			Included	
Industry fixed-effects			Included			Included			Included			Included			Included			Included	
Cluster by Year			No			No			No			Yes			Yes			Yes	
Cluster by Firm			Yes			Yes			Yes			Yes			Yes			Yes	
R^2			0.362			0.376			0.380			0.339			0.409			0.414	
N			1,347			1,019			1,019			1,347			1,019			1,019	

*** are significant at p<0.01, ** are significant at p<0.05 and *at p<0.10. All p-values are one-tailed, except for the industry specialist auditor variables and the corporate governance variables which are two-tailed. Industry fixed-effects and year fixed-effects are not reported for brevity Refer Table 5.8 for definition of variables.

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11.3 Alternative definitions of auditor industry leadership at audit firm level

This section tests whether the sensitivity of the earnings quality results using the firm national-city framework is robust against alternative definitions of auditor industry leadership found in prior studies, such as; 1) at least 10 percentage points greater market share between the top-ranked and second-ranked industry leader in a national (city) audit market (Mayhew and Wilkins, 2003), and 2) the cut-off approach introduced by Neal and Riley (2004) in determining national (city) industry leadership. Both these alternatives definitions have been discusses in detail in Section 8.5 under the robustness test performed for the first empirical analysis chapter.

Table 11.4 below presents the results for the *DAC_PERF* model. Results for the 10 percent market share cut-off measure following Mayhew and Wilkins (2003) are presented in Model 1, whereas results for the cut-off measures following Neal and Riley (2004) are presented Model 2. Both results from Model 1 and Model 2 show comparable results with the one reported in the main analysis in Chapter 10, except that the coefficient for national industry leadership alone has lost its significant at p=0.10 under the *DAC_PERF* analysis. However, taken together, it can be concluded that the findings on the importance of joint firm national city industry leadership in constraining discretionary accruals is robust to alternative market share cut-off for determining industry specialist.

11.4 Effect of competitive pressure on auditor industry specialisation and earnings quality

Prior research document that industry specialist auditor provides higher audit quality and earnings quality relative to non-specialist based on evidence of lower discretionary accruals, higher likelihood of issuing modified audit opinion, higher likelihood of meeting or beating earnings forecast by one penny share, better client's disclosure quality and higher ERC (Balsam *et al*., 2003; Krishnan, 2003; Dunn and Mayhew, 2004; Kwon, 2007; Reichelt and Wang, 2010; Sun and Liu, 2013). Despite that, more recent study by Numan and Willekens (2014) in the U.S. shows that the audit quality of the industry specialist auditor is affected by the competitive pressure from its close competitors. Competitive pressure, in their study, is measured by the closeness in the market share distance between the industry specialist auditor and its closest competitor at the city industry level. They find that when the competitive pressure effect is controlled for in their earnings quality models, the effect of industry specialist auditor disappears. Thus, they report that the likelihood of issuing a going concern opinion to a financially distressed firm, and earnings quality (measured as the occurrence of restatements and absolute accruals) of the clients decrease as competitive pressure from the industry specialist auditor increases.

Table 11.4: *DAC_PERF* and *AEE* Regression using different market shares cut-off for audit firm industry specialisation

		DAC_PERF								***AEE***							
		Model 1				**Model 2**				**Model 1**				**Model 2**			
Variables	**+/-**	**coef.**	**t-stat**	**p-value**	**sig.**	**coef.**	**t-stat**	**p-value**	**sig.**	**coef.**	**t-stat**	**p-value**	**sig.**	**coef.**	**t-stat**	**p-value**	**sig.**
Intercept		0.104	1.730	0.042	**	0.106	1.760	0.040	**	0.141	2.150	0.016	**	0.132	1.960	0.025	**
TA	+	0.002	0.200	0.421		0.001	0.150	0.439		0.002	0.180	0.430		0.003	0.300	0.383	
PYTAC	+	0.023	1.460	0.072	*	0.023	1.460	0.072	*	-0.002	-0.220	0.415		-0.002	-0.200	0.421	
DE	-	-0.058	-2.100	0.018	**	-0.059	-2.100	0.018	**	-0.035	-0.980	0.164		-0.039	-1.080	0.141	
GROWTH	+	0.003	0.500	0.310		0.003	0.530	0.299		0.008	0.770	0.220		0.008	0.830	0.205	
MB	+	0.002	1.500	0.068	*	0.002	1.490	0.068	*	0.000	0.410	0.340		0.000	0.360	0.360	
CFO	-	-0.180	-2.930	0.002	***	-0.179	-2.920	0.002	***	-0.051	-1.720	0.043	**	-0.049	-1.680	0.046	**
LOSS	+	0.005	0.230	0.408		0.004	0.210	0.415		0.023	1.820	0.035	**	0.023	1.800	0.036	**
ALTMAN	-	-0.004	-0.580	0.282		-0.003	-0.490	0.311		-0.013	-2.890	0.002	***	-0.013	-2.870	0.002	***
BLOCKOWN	+	-0.003	-0.510	0.305		-0.003	-0.500	0.307		0.003	0.800	0.212		0.003	0.680	0.248	
BIG4	-	-0.026	-1.380	0.084	*	-0.021	-1.120	0.131		0.001	0.070	0.473		0.006	0.340	0.367	
SECOND	-	-0.043	-2.180	0.015	**	-0.043	-2.170	0.015	**	-0.024	-1.580	0.058	*	-0.024	-1.560	0.060	*
Industry Specialist Auditor																	
JOINT_		-0.017	-1.870	0.061	**	-0.019	-2.040	0.041	**	-0.016	-1.670	0.095	*	-0.029	-2.400	0.017	**
CITY_ONLY		-0.014	-1.060	0.288		-0.019	-1.050	0.293		-0.016	-1.170	0.244		-0.007	-0.440	0.657	
NAT_ONLY		0.013	0.550	0.581		-0.008	-0.600	0.548		-0.001	-0.070	0.944		-0.016	-1.150	0.252	
Corporate Governance																	
BODFEM		0.003	0.660	0.510		0.003	0.630	0.530		0.007	1.230	0.218		0.007	1.340	0.181	
BODFOREIGN		0.008	1.280	0.200		0.008	1.300	0.193		0.002	0.340	0.731		0.003	0.510	0.612	
INTAUD		-0.012	-1.140	0.254		-0.012	-1.120	0.262		-0.014	-1.220	0.224		-0.014	-1.230	0.219	
ACSIZE		-0.005	-0.920	0.360		-0.005	-0.950	0.343		0.003	0.390	0.695		0.002	0.360	0.718	
ACINDP		-0.001	-0.120	0.907		-0.002	-0.210	0.832		0.012	1.620	0.105		0.011	1.620	0.106	
ACFINEXP		0.008	1.740	0.083	*	0.008	1.790	0.074	*	-0.003	-0.630	0.528		-0.002	-0.510	0.613	
ACMEET		-0.005	-0.770	0.444		-0.005	-0.820	0.413		-0.007	-0.680	0.497		-0.007	-0.750	0.456	
Year fixed-effects			Included				Included				Included				Included		
Industry fixed-effects			Included				Included				Included				Included		
R^2			0.213				0.213				0.115				0.118		
N			1,347				1,347				1,083				1,083		

*** are significant at p<0.01, ** are significant at p<0.05 and *at p<0.10. All p-values are one-tailed, except for industry specialist auditor variables and corporate governance variables which are two-tailed. Industry fixed-effects and year fixed-effects are not reported for brevity, and t-statistics and significance levels are calculated using the White (1980) robust standard errors to correct for heteroscedasticity. Refer Table 5.8 for definition of variables.

Following Numan and Willikens (2014), this study now attempts to disentangle the effect of industry specialist auditor and competitive pressure on three different measures of earnings quality; *DAC_PERF*, *AEE* and *PROFIT*. Thus, this study tests for the effect of competitive pressure on the industry specialist auditor's ability to constrain earnings management, by re-estimating the firm national-city framework analysis as used in the last chapter for each *DAC_PERF*, *AEE* and *PROFIT* analysis. Consistent with Degryse and Ongena (2005) each model explicitly controls for potential market power effects due to general supplier concentration by including the Herfindahl index (*HERFINDEX*) as a control variable in the model. Competitive pressure from the closest competitor is defined as the absolute difference between the incumbent audit office's market share in the client's industry and the market share of the competitor that is closest (in terms of market share) to that of the incumbent (Numan and Willekens, 2012). Also, following Numan and Willekens (2014), in order to make the interpretation of the analysis more intuitive, competitive pressure is defined as a measure of "*closeness*" (rather than "*distance*") and hence take the negative of this absolute distance, which results in the variable Competitive pressure. The audit firm industry specialist, *HERFINDEX* and competitive pressure are calculated using all observations for which audit fee and location data are available in FAME database.

The results of the analysis are presented in Table 11.5 below. All regression models in Table 11.5 are significant (p-value <0.01), with an adjusted R^2 is about 0.211. The Model 1 to Model 3 tests for the effect of joint national-city industry leadership on *DAC_PERF*, alongside the corporate governance variables. The results of the Model 3 in Table 10.1 under the firm national-city framework in the earlier chapter indicate that either the audit firm which is a joint national and city industry leader or national industry leader alone are able to reduce *DAC_PERF*, but not the city industry leader alone. Thus *JOINT_NAT#2-CITY#1* will be chosen as the variable of interest, which is the experimental variable in this analysis, while *CITY#1_ONLY* and *NAT#2_ONLY* will be listed alongside the control variables. The *JOINT_NAT#2-CITY#1* represents the auditor alignment with the client's industry in the application of the spatial competition theory. Based on the Model 3 results, it can be seen that the variable *COMPETITIVE* is positively related to the magnitude of discretionary accruals (coefficient=0.022, p<0.10), indicating that earnings quality is negatively affected by the competitive pressure from the closest auditor. Whereas the industry specialist variable *JOINT_NAT#2-CITY#1* which was significant in Model 2 earlier, has now become insignificant. This finding suggests that earnings quality (as measured by magnitude of discretionary accruals) of the clients decreases as competitive pressure of the industry specialist auditor increases.

Next, the same competitive pressure analysis is performed using the *AEE* model to determine whether competitive pressure has any effect in reducing accrual estimation error. Since the results of the Model 3 in Table 10.2 under the firm national-city framework in the earlier chapter indicates that only the audit firm which is a joint national and city industry leader is able to reduce *AEE*, but not the city industry leader alone or the national industry leader alone, then *JOINT_NAT#1-CITY#1* will be the variable of interest, which is the experimental variable in this analysis, while *CITY#1_ONLY* and *NAT#1_ONLY* will be listed alongside as the control variables. The same *HERFINDEX* are being included in the regressions in Table 11.6. All regression models in Table 11.6 are significant (p-value <0.01), with an adjusted R^2 is about 0.117. Similar results are obtained as for Model 3 as in the *DAC_PERF* analysis conducted previously. Variable *COMPETITIVE* is significantly positive (coefficient=0.035, p<0.05), which indicates supports the contention that earnings quality (as measured by accrual estimation error) of the clients decreases as competitive pressure of the industry specialist auditor increases.

Finally, the same competitive pressure analysis is performed using the *PROFIT* model to determine whether competitive pressure has any effect on the industry specialist auditor likelihood of reporting a profit rather than a loss. Since the results of the Model 3 in Table 10.4 under the firm national-city framework in the earlier chapter indicates that only the audit firm which is a joint national and city industry leader is more likely to report a loss rather than a profit, but not the city industry leader alone or the national industry leader alone, then *JOINT_NAT#3-CITY#1* will be the variable of interest, which is the experimental variable in this analysis, while *CITY#1_ONLY* and *NAT#3_ONLY* will be listed alongside the control variables. Similar industry *HERFINDEX* being included in the regressions in Table 11.7. All regression models in Table 11.7 are significant (p-value <0.01), with an adjusted R^2 is about 0.373. In contrast to the previous results reported for *DAC_PERF* and *AEE* earlier, variable *COMPETITIVE* in Model 3 is not significant at any conventional level. Whereas *JOINT_NAT#3-CITY#1* is significantly negative (coefficient=-0.394, p<0.10), which indicates that industry specialist auditor likelihood of reporting a profit rather than a loss is not affected by the competitive pressure from the close competitors.

Taken together, two out of three of the earnings quality measures (*DAC_PERF* and *AEE*) are consistent with the industry expertise dominance an audit firm has over its closest competitor being a main driver of audit quality, rather than industry expertise *per se*. Overall, the results suggest that pressure from close competitors has a negative effect on audit quality (except for the *PROFIT* analysis).

Table 11.5: *DAC_PERF* Regression on the effect of competitive pressure on auditor industry specialisation and earnings quality

		Model 1				Model 2				Model 3			
Variables	**+/-**	**coef.**	**t-stat**	**p-value**	**sig.**	**coef.**	**t-stat**	**p-value**	**sig.**	**coef.**	**t-stat**	**p-value**	**sig.**
Intercept		0.104	1.220	0.115		0.112	1.240	0.112		0.103	1.120	0.135	
TA	+	0.000	0.000	0.500		0.000	-0.020	0.493		0.000	0.010	0.494	
PYTAC	+	0.024	1.760	0.044	**	0.024	1.770	0.043	**	0.024	1.740	0.045	**
DE	-	-0.059	-2.810	0.004	***	-0.059	-2.780	0.005	***	-0.058	-2.790	0.005	***
GROWTH	+	0.003	0.390	0.348		0.003	0.390	0.349		0.003	0.380	0.355	
MB	+	0.002	1.890	0.034	**	0.002	1.880	0.035	**	0.002	1.840	0.038	**
CFO	-	-0.173	-2.180	0.019	**	-0.172	-2.190	0.018	**	-0.174	-2.210	0.017	**
LOSS	+	0.006	0.310	0.381		0.006	0.330	0.373		0.006	0.310	0.378	
ALTMAN	-	-0.003	-0.460	0.323		-0.004	-0.500	0.310		-0.004	-0.490	0.315	
BLOCKOWN	+	-0.003	-0.610	0.274		-0.003	-0.610	0.273		-0.003	-0.660	0.258	
BIG4	-	0.002	0.100	0.462		0.002	0.090	0.464		0.002	0.110	0.455	
SECOND	-	-0.026	-1.700	0.049	**	-0.026	-1.690	0.051	*	-0.026	-1.670	0.053	*
CITY#1_ONLY		-0.002	-0.090	0.926		-0.001	-0.050	0.959		0.004	0.150	0.881	
NAT#2_ONLY		-0.019	-1.470	0.150		-0.019	-1.480	0.147		-0.019	-1.450	0.157	
<u>*Experimental variables:*</u>													
JOINT_NAT#2-CITY#1		-0.030	-1.790	0.082	*	-0.029	-1.740	0.091	*	-0.023	-1.400	0.171	
HERFINDEX						-0.011	-0.360	0.721		0.006	0.170	0.868	
COMPETITIVE PRESSURE										0.022	1.700	0.099	*
<u>*Corporate Governance*</u>													
BODFEM		0.003	0.720	0.474		0.003	0.770	0.446		0.004	0.800	0.430	
BODFOREIGN		0.011	2.240	0.032	**	0.011	2.240	0.032	**	0.011	2.160	0.038	**
INTAUD		-0.012	-0.890	0.381		-0.012	-0.880	0.387		-0.012	-0.870	0.389	
ACSIZE		-0.004	-0.900	0.377		-0.004	-0.900	0.377		-0.004	-0.920	0.364	
ACINDP		0.000	-0.020	0.984		0.000	-0.020	0.983		0.000	-0.020	0.986	
ACFINEXP		0.009	2.190	0.036	**	0.009	2.180	0.036	**	0.009	2.200	0.035	**
ACMEET		-0.006	-0.730	0.468		-0.006	-0.710	0.483		-0.006	-0.670	0.506	
Year fixed-effects		Included				Included				Included			
Industry fixed-effects		Included				Included				Included			
Cluster by audit firm		34				34				34			
R^2		0.211				0.211				0.211			
N		1293				1293				1293			

*** are significant at p<0.01, ** are significant at p<0.05 and *at p<0.10. All p-values are one-tailed. Industry fixed-effects and year fixed-it effects are not reported for brevity, and standard errors are adjusted for heteroskedasticity and possible correlation within an audit firm cluster, following the methodology of Rogers (1993) as used by Numan and Wilekens (2014). Refer Table 5.8 for definition of variables.

Table 11.6: *AEE* Regression on the effect of competitive pressure on auditor industry specialisation and earnings quality

		Model 1				Model 2				Model 3			
Variables	**+/-**	**coef.**	**t-stat**	**p-value**	**sig.**	**coef.**	**t-stat**	**p-value**	**sig.**	**coef.**	**t-stat**	**p-value**	**sig.**
Intercept		0.144	1.800	0.042	**	0.160	1.910	0.033	**	0.145	1.700	0.050	*
TA	+	0.001	0.100	0.462		0.001	0.050	0.959		0.001	0.120	0.453	
PYTAC	+	-0.003	-0.280	0.392		-0.003	-0.240	0.813		-0.003	-0.280	0.393	
DE	-	-0.036	-1.470	0.076	*	-0.037	-1.500	0.145		-0.036	-1.430	0.082	*
GROWTH	+	0.008	0.620	0.271		0.008	0.620	0.543		0.008	0.600	0.276	
MB	+	0.000	0.560	0.289		0.000	0.630	0.532		0.000	0.510	0.306	
CFO	-	-0.044	-2.090	0.023	**	-0.043	-2.000	0.055	*	-0.045	-2.050	0.025	**
LOSS	+	0.025	1.960	0.030	**	0.025	2.070	0.047	**	0.025	1.980	0.029	**
ALTMAN	-	-0.014	-4.840	0.000	***	-0.015	-5.850	0.000	***	-0.015	-6.360	0.000	***
BLOCKOWN	+	0.003	0.550	0.293		0.003	0.520	0.606		0.002	0.450	0.328	
BIG4	-	0.002	0.140	0.446		0.002	0.150	0.879		0.003	0.180	0.428	
SECOND	-	-0.025	-1.970	0.029	**	-0.026	-2.020	0.053	*	-0.025	-1.940	0.031	**
CITY#1_ONLY		0.004	0.160	0.872		0.005	0.210	0.831		0.013	0.560	0.583	
NAT#1_ONLY		-0.005	-0.350	0.729		-0.007	-0.550	0.587		-0.005	-0.380	0.707	
Experimental variables:													
JOINT_NAT#1-CITY#1		-0.020	-1.690	0.102		-0.019	-1.510	0.141		-0.010	-0.680	0.500	
HERFINDEX						-0.024	-1.390	0.174		0.004	0.220	0.831	
COMPETITIVE PRESSURE										0.035	2.060	0.048	**
Corporate Governance													
BODFEM		0.007	2.060	0.049	**	0.007	2.140	0.041	**	0.007	2.300	0.029	**
BODFOREIGN		0.004	0.580	0.568		0.004	0.580	0.565		0.003	0.460	0.651	
INTAUD		-0.012	-1.440	0.161		-0.012	-1.400	0.173		-0.011	-1.370	0.180	
ACSIZE		0.003	0.390	0.698		0.003	0.380	0.705		0.003	0.360	0.722	
ACINDP		0.012	2.050	0.050	*	0.012	2.070	0.047	*	0.012	2.050	0.049	**
ACFINEXP		-0.003	-0.630	0.536		-0.003	-0.610	0.545		-0.003	-0.570	0.571	
ACMEET		-0.008	-0.860	0.396		-0.007	-0.850	0.404		-0.007	-0.770	0.446	
Year fixed-effects			Included				Included				Included		
Industry fixed-effects			Included				Included				Included		
Cluster by audit firm			30				30				30		
R^2			0.116				0.116				0.118		
N			1,046				1,046				1,046		

*** are significant at p<0.01, ** are significant at p<0.05 and *at p<0.10. All p-values are one-tailed. Industry fixed-effects and year fixed-it effects are not reported for brevity, and standard errors are adjusted for heteroskedasticity and possible correlation within an audit firm cluster, following the methodology of Rogers (1993) as used by Numan and Wilekens (2014). Refer Table 5.8 for definition of variables.

Table 11.7: *PROFIT* Regression on the effect of competitive pressure on auditor industry specialisation and earnings quality

		Model 1				Model 2				Model 3			
Variables	**+/-**	**coef.**	**t-stat**	**p-value**	**sig.**	**coef.**	**t-stat**	**p-value**	**sig.**	**coef.**	**t-stat**	**p-value**	**sig.**
Intercept		-0.466	-0.860	0.195		-0.230	-0.560	0.288					
TA	+	0.123	1.740	0.041	**	0.116	1.770	0.039	**	0.114	1.800	0.036	**
PYTAC	+	0.099	0.240	0.407		0.092	0.220	0.412		0.090	0.220	0.414	
DE	-	-1.942	-4.290	0.000	***	-1.915	-4.360	0.000	***	-1.912	-4.430	0.000	***
GROWTH	+	0.069	0.840	0.201		0.069	0.840	0.200		0.069	0.850	0.199	
MB	+	0.021	1.750	0.041	**	0.022	1.820	0.035	**	0.022	1.830	0.034	**
CFO	-	2.459	3.380	0.001	***	2.473	3.390	0.001	***	2.476	3.380	0.001	***
LOSS	+	-0.804	-5.530	0.000	***	-0.799	-5.410	0.000	***	-0.800	-5.520	0.000	***
ALTMAN	-	0.163	1.700	0.045	**	0.157	1.660	0.049	**	0.157	1.660	0.049	**
BLOCKOWN	+	-0.016	-0.350	0.365		-0.018	-0.380	0.353		-0.017	-0.350	0.363	
BIG4	-	0.190	0.940	0.173		0.184	0.910	0.182		0.184	0.920	0.180	
SECOND	-	0.096	0.770	0.222		0.091	0.730	0.234		0.090	0.710	0.238	
CITY#1_ONLY		0.501	1.690	0.090		0.545	1.760	0.078		0.523	2.000	0.045	
NAT#3_ONLY	-	-0.233	-1.010	0.311		-0.230	-1.010	0.315		-0.232	-1.040	0.296	
<u>*Experimental variables:*</u>													
JOINT_NAT#3-CITY#1		-0.400	-1.740	0.081	**	-0.376	-1.510	0.132		-0.394	-1.910	0.057	*
HERFINDEX						-0.366	-0.640	0.523		-0.418	-0.560	0.577	
COMPETITIVE PRESSURE										-0.067	-0.230	0.819	
<u>*Corporate Governance*</u>													
BODFEM		0.012	0.200	0.839		0.016	0.260	0.795		0.016	0.260	0.796	
BODFOREIGN		-0.055	-1.500	0.134		-0.055	-1.500	0.133		-0.054	-1.440	0.151	
INTAUD		0.134	1.370	0.171		0.141	1.500	0.133		0.141	1.490	0.137	
ACSIZE		0.038	0.840	0.401		0.039	0.870	0.386		0.040	0.870	0.385	
ACINDP		0.009	0.180	0.855		0.008	0.170	0.864		0.008	0.170	0.866	
ACFINEXP		0.010	0.150	0.881		0.010	0.160	0.875		0.010	0.150	0.880	
ACMEET		0.014	0.260	0.798		0.015	0.280	0.779		0.014	0.270	0.791	
Year fixed-effects		Included				Included				Included			
Industry fixed-effects		Included				Included				Included			
Cluster by audit firm		34				34				34			
R^2		0.373				0.373				0.373			
N		1,293				1,293				1,293			

*** are significant at p<0.01, ** are significant at p<0.05 and *at p<0.10. All p-values are one-tailed. Industry fixed-effects and year fixed-it effects are not reported for brevity, and standard errors are adjusted for heteroskedasticity and possible correlation within an audit firm cluster, following the methodology of Rogers (1993) as used by Numan and Wilekens (2014). Refer Table 5.8 for definition of variables.

11.5 Continuous market share as a measure of industry leadership

Next, the study tests whether the industry specialist auditor main results reported earlier in Chapter 10 are robust to the use of this alternative definition. Table 11.8 below presents the analysis for the *DAC_PERF* models, Table 11.9 presents the results for the *AEE* models, whereas Table 11.10 tabulates the results for the *PROFIT* models. In these models, the industry specialist auditor variables are measured using the continuous market shares.

As shown in Table 11.8, for the *DAC_PERF* model when the audit fee regression is estimated using the *Firm national specialist* and *Firm city specialist* variables in Model 1, significant and negative coefficient is only reported at the city level (coefficient=-0.037) at p<0.05, whereas the coefficient for national level is insignificant at p=0.10. This shows that, using the continuous market share measure, city level industry leadership of the audit firm is more important than national-level expertise in reducing discretionary accruals, consistent with the main analysis findings in Chapter 10. However, when the same regression is estimated using the audit partner national and city market share variables (*Partner national specialist* and *Partner city specialist)* in Model 2, none of the partner continuous market share variable is significant at p=0.10. This indicates that partner industry leadership is not an important condition to constrain discretionary accruals. Finally, in Model 3, when the firm and partner industry leadership are tested together (*Firm national specialist, Firm city specialist, Partner national specialist* and *Partner city specialist),* only the coefficient for the firm city specialist is negatively significant (coefficient=-0.073, p<0.01). Thus, the finding using the continuous market share measure suggests that audit firm city industry leadership matters the most as it provides differentially higher audit quality above the firm industry leadership at the national level and beyond the partner industry leadership in reducing the magnitude of discretionary accruals.

Next, Table 11.9 below presents the results for the *AEE* models. As shown in the Table 11.9, when the regression is estimated using the national and city market share variables (*Firm national specialist* and *Firm city specialist)* in Model 1, a negatively significant coefficient is only reported at the city level (coefficient=-0.032) at p<0.05, whereas the coefficient for national level is insignificant at p=0.10. As with the *DAC_PERF* results reported in the preceding paragraph, this shows that city level industry leadership of the audit firm is more important than national-level expertise in reducing the *AEE*. However, when the regression is estimated using the audit partner national and city market share variables (*Partner national specialist and Partner city specialist)* in Model 2, the *Partner city specialist* is negatively significant at p<0.10 (coefficient=-0.025), suggesting that partner industry specialisation at the city level is more important than its national industry leadership. Finally, in Model 3, and similarly to Model 3 results under *DAC_PERF* analysis in Table 11.8 earlier, when the firm and partner industry leadership are combined (similar to joint firm-partner industry leadership framework), only the coefficient for *Firm city specialist* is significant and negative (coefficient=-0.040, p<0.05). Thus, the finding using the continuous market share measure suggest that audit firm city industry leadership matters the most as it provides differentially higher audit quality above the firm industry leadership at the national level and beyond the partner industry leadership in reducing the magnitude of *AEE*.

Finally, Table 11.10 presents the results for the *PROFIT* models. As shown in Table 11.10 below, when the regression is estimated using the audit firm national and city market share variables (*Firm national specialist* and *Firm city specialist* in Model 1), a negatively significant coefficient is reported at the national level (coefficient=-0.439, $p<0.05$), whereas the coefficient for city level is insignificant at $p=0.10$. This result is different from the previous two analyses using discretionary accruals and the *AEE*, and shows that an audit firm that is an industry leader at the national level is more conservative in their profit reporting as they are more likely to report a loss rather than a profit. When the regression is estimated using the audit partner national and city market share variables (*Partner national specialist* and *Partner city specialist* in Model 2), none of the specialist partners continuous variable are significant at $p=0.10$. This indicates that partner industry leadership is not important in this model at all. Finally, in Model 3, when the firm and partner industry leadership is combined together (similar to joint firm-partner industry leadership framework), only the coefficient for the *Firm national specialist* is negatively significant (coefficient=-0.579, $p<0.05$). Thus, the finding using the continuous market share measure suggest that audit firm national industry leadership matters the most as it provides differentially higher audit quality above the firm industry leadership at the city level and beyond the partner industry leadership in conservative profit reporting.

Taken together, these findings using the continuous measure of auditor industry expertise provide inconsistent results relative to the results in the main analysis in Chapter 10 earlier in respect of the *DAC_PERF*, *AEE* and *PROFIT* models. This inconsistency arises because the use of continuous market share assumes log-linear relationship between the industry specialist market share and earnings quality, and avoids arbitrary definition of an industry specialist (Goodwin and Wu, 2014). However, this assumption does not describe the actual auditing industry, where evidence from prior studies indicates that there is a differential audit quality between the top-ranked and second-ranked industry leader using the national-city framework, either at the firm (Ferguson *et al*. 2003; Francis *et al*., 2005; Basioudis and Francis 2007) or partner level (Goodwin and Wu, 2014). Furthermore, there is a huge gap in the market shares reported between the top-ranked and second-ranked audit firm or partner in this thesis, as shown in Table 6.4 earlier. Thus, to accommodate such a non-linear relationship between the auditor industry leadership and earnings quality, this study use the indicator variables to investigate how different levels of industry leadership affect the earnings quality in our main regression model presented in Chapter 10 earlier.

Table 11.8: *DAC_PERF* Regression using continuous market share for industry specialist auditor

		Model 1				Model 2				Model 3			
Variables	**+/-**	**coef.**	**t-stat**	**p-value**	**sig.**	**coef.**	**t-stat**	**p-value**	**sig.**	**coef.**	**t-stat**	**p-value**	**sig.**
Intercept		0.113	1.850	0.033	**	0.126	1.460	0.073	*	0.119	1.380	0.084	*
TA	+	0.001	0.080	0.466		-0.003	-0.290	0.387		-0.002	-0.160	0.438	
PYTAC	+	0.023	1.460	0.073	*	0.024	1.060	0.144		0.023	1.020	0.155	
DE	-	-0.053	-1.930	0.027	**	-0.047	-1.420	0.078	*	-0.040	-1.220	0.111	
GROWTH	+	0.003	0.520	0.303		-0.005	-0.580	0.281		-0.005	-0.660	0.255	
MB	+	0.002	1.470	0.071	*	0.002	1.310	0.096	*	0.002	1.270	0.102	
CFO	-	-0.179	-2.940	0.002	***	-0.197	-2.670	0.004	***	-0.203	-2.730	0.003	***
LOSS	+	0.004	0.210	0.417		0.012	0.510	0.307		0.011	0.460	0.322	
ALTMAN	-	-0.003	-0.480	0.317		-0.002	-0.230	0.410		-0.003	-0.350	0.364	
BLOCKOWN	+	-0.003	-0.530	0.298		-0.002	-0.240	0.407		-0.001	-0.170	0.433	
BIG4	-	-0.019	-0.950	0.171		-0.025	-1.100	0.136		-0.020	-0.850	0.199	
SECOND	-	-0.040	-2.060	0.020	**	-0.043	-1.830	0.034	**	-0.043	-1.810	0.036	**
Industry Specialist Auditor													
Firm national specialist		0.004	0.180	0.430						0.033	0.990	0.161	
Firm city specialist		-0.037	-1.930	0.027	**					-0.073	-2.430	0.008	***
Partner national specialist						-0.029	-0.510	0.304		-0.045	-0.840	0.201	
Partner city specialist						-0.015	-0.720	0.235		0.037	1.380	0.916	
Corporate Governance													
BODFEM		0.003	0.650	0.514		0.007	1.260	0.208		0.008	1.320	0.186	
BODFOREIGN		0.007	1.130	0.258		0.007	0.900	0.368		0.006	0.780	0.434	
INTAUD		-0.011	-1.060	0.288		-0.002	-0.160	0.870		-0.003	-0.210	0.831	
ACSIZE		-0.005	-0.950	0.342		-0.007	-1.110	0.268		-0.008	-1.150	0.251	
ACINDP		-0.002	-0.190	0.847		-0.002	-0.220	0.829		-0.003	-0.240	0.809	
ACFINEXP		0.008	1.790	0.073	*	0.012	2.000	0.046	**	0.012	2.020	0.043	**
ACMEET		-0.005	-0.770	0.443		-0.002	-0.300	0.763		-0.002	-0.260	0.794	
Year fixed-effects		Included				Included				Included			
Industry fixed-effects		Included				Included				Included			
R^2		0.214				0.229				0.232			
N		1,347				1,019				1,019			

*** are significant at p<0.01, ** are significant at p<0.05 and *at p<0.10. All p-values are one-tailed, except for corporate governance variables which are two-tailed. Industry fixed-effects and year fixed-effects are not reported for brevity, and t-statistics and significance levels are calculated using the White (1980) robust standard errors to correct for heteroscedasticity. Refer Table 5.8 for definition of variables.

Table 11.9: *AEE* Regression using continuous market share for industry specialist auditor

		Model 1				Model 2				Model 3			
Variables	**+/-**	**coef.**	**t-stat**	**p-value**	**sig.**	**coef.**	**t-stat**	**p-value**	**sig.**	**coef.**	**t-stat**	**p-value**	**sig.**
Intercept		0.141	2.060	0.020	**	0.168	2.490	0.007	***	0.165	2.450	0.008	***
TA	+	0.002	0.210	0.419		-0.004	-0.490	0.313		-0.003	-0.400	0.344	
PYTAC	+	-0.002	-0.210	0.416		-0.011	-0.850	0.199		-0.011	-0.850	0.199	
DE	-	-0.032	-0.890	0.188		0.009	0.250	0.402		0.012	0.320	0.374	
GROWTH	+	0.008	0.760	0.225		-0.003	-0.330	0.369		-0.003	-0.410	0.341	
MB	+	0.000	0.310	0.378		0.000	0.190	0.426		0.000	0.160	0.435	
CFO	-	-0.052	-1.780	0.038	**	-0.031	-1.090	0.138		-0.037	-1.270	0.102	
LOSS	+	0.023	1.790	0.037	**	0.009	0.910	0.182		0.008	0.800	0.214	
ALTMAN	-	-0.013	-2.780	0.003	***	-0.007	-1.450	0.074	*	-0.008	-1.610	0.054	*
BLOCKOWN	+	0.003	0.700	0.241		0.000	0.060	0.478		0.001	0.130	0.447	
BIG4	-	0.010	0.500	0.309		0.000	0.000	0.500		0.004	0.230	0.411	
SECOND	-	-0.021	-1.400	0.081	*	-0.007	-0.450	0.326		-0.007	-0.430	0.335	
<u>*Industry Specialist Auditor*</u>													
Firm national specialist		-0.013	-0.560	0.287						0.014	0.550	0.291	
Firm city specialist		-0.032	-2.050	0.020	**					-0.040	-2.080	0.019	**
Partner national specialist						-0.039	-0.830	0.203		-0.045	-0.880	0.190	
Partner city specialist						-0.025	-1.530	0.063	*	0.004	0.190	0.426	
<u>*Corporate Governance*</u>													
BODFEM		0.007	1.330	0.184		-0.004	-0.490	0.131		0.010	1.570	0.118	
BODFOREIGN		0.002	0.310	0.759		-0.011	-0.850	0.199		0.001	0.220	0.823	
INTAUD		-0.013	-1.160	0.244		0.009	0.250	0.402		-0.014	-1.170	0.242	
ACSIZE		0.002	0.350	0.724		-0.003	-0.330	0.369		-0.005	-0.950	0.342	
ACINDP		0.011	1.560	0.118		0.000	0.190	0.426		0.015	2.520	0.012	**
ACFINEXP		-0.002	-0.530	0.596		-0.031	-1.090	0.138		-0.002	-0.370	0.709	
ACMEET		-0.007	-0.690	0.490		0.009	0.910	0.182		0.000	0.020	0.980	
Year fixed-effects			Included				Included				Included		
Industry fixed-effects			Included				Included				Included		
R^2			0.117				0.229				0.232		
N			1,083				1,019				1,019		

*** are significant at p<0.01, ** are significant at p<0.05 and *at p<0.10. All p-values are one-tailed. Industry fixed-effects and year fixed-effects are not reported for brevity, and t-statistics and significance levels are calculated using the White (1980) robust standard errors to correct for heteroscedasticity. Refer Table 5.8 for definition of variables.

Table 11.10: *PROFIT* Regression using continuous market share for industry specialist auditor

		Model 1				Model 2				Model 3			
Variables	**+/-**	**coef.**	**t-stat**	**p-value**	**sig.**	**coef.**	**t-stat**	**p-value**	**sig.**	**coef.**	**t-stat**	**p-value**	**sig.**
Intercept		-0.399	-0.600	0.275		-0.972	-1.120	0.132		-1.023	-1.170	0.122	
TA	+	0.108	1.250	0.106		0.175	1.550	0.060	*	0.183	1.610	0.053	*
LEV	-	-0.067	-0.190	0.425		0.077	0.180	0.427		0.057	0.130	0.447	
TAC	-	-1.853	-3.760	0.000	***	-1.776	-2.940	0.002	***	-1.816	-3.030	0.001	***
GROWTH	+	0.067	1.030	0.152		0.122	1.460	0.072	*	0.122	1.440	0.075	*
MB	+	0.020	1.650	0.050	*	0.016	1.290	0.098	*	0.017	1.340	0.090	*
CFO	+	2.388	4.540	0.000	***	2.502	3.850	0.000	***	2.502	3.860	0.000	***
LAG LOSS	-	-0.783	-7.620	0.000	***	-0.784	-6.610	0.000	***	-0.788	-6.640	0.000	***
ALTMAN	+	0.177	2.460	0.007	***	0.226	2.610	0.005	***	0.231	2.680	0.004	***
BLOCKOWN	-	-0.011	-0.240	0.407		0.001	0.020	0.491		-0.002	-0.040	0.485	
BIG4	-	0.173	1.120	0.131		-0.034	-0.200	0.420		0.112	0.610	0.272	
SECOND	-	0.203	1.430	0.076	*	0.095	0.580	0.281		0.090	0.550	0.293	
<u>*Industry Specialist Auditor*</u>													
Firm national specialist		-0.439	-1.650	0.049	**					-0.579	-1.700	0.044	**
Firm city specialist		-0.088	-0.430	0.333						-0.005	-0.020	0.494	
Partner national specialist						0.429	0.480	0.316		0.728	0.780	0.217	
Partner city specialist						-0.214	-0.880	0.189		-0.136	-0.390	0.347	
<u>*Corporate Governance*</u>													
BODFEM		0.007	0.110	0.458		-0.001	-0.020	0.492		0.001	0.010	0.496	
BODFOREIGN		-0.063	-1.050	0.148		-0.089	-1.310	0.096	*	-0.083	-1.220	0.111	
INTAUD		0.171	1.390	0.083	*	0.165	1.140	0.128		0.157	1.090	0.138	
ACSIZE		0.052	0.850	0.198		0.024	0.340	0.368		0.025	0.350	0.362	
ACINDP		0.003	0.050	0.482		-0.001	-0.020	0.493		-0.006	-0.070	0.473	
ACFINEXP		0.014	0.290	0.385		0.015	0.260	0.397		0.020	0.350	0.364	
ACMEET		0.004	0.060	0.475		-0.030	-0.450	0.327		-0.040	-0.590	0.276	
Year fixed-effects		Included				Included				Included			
Industry fixed-effects		Included				Included				Included			
R^2		0.359				0.374				0.377			
N		1,347				1,019				1,019			

*** are significant at p<0.01, ** are significant at p<0.05 and *at p<0.10. All p-values are one-tailed. Industry fixed-effects and year fixed-effects are not reported for brevity, and t-statistics and significance levels are calculated using the White (1980) robust standard errors to correct for heteroscedasticity. Refer Table 5.8 for definition of variables.

11.6 Effect of gender and tenure on audit partner industry expertise

Table 11.11 below presents the moderating effects of audit partner gender on the audit partner industry specialist ability to constrain earnings management. The experimental variable, which is *PART_FEM* represents an indicator variable, coded 1 if the audit partner is a female, and 0 if otherwise. Interestingly, when the gender of the audit partner (*PART_FEM*) is controlled of in the model, none of the partner variable in either the *DAC_PERF* model, the *AEE* model or the *PROFIT* model is significant at p=0.10. Even the *PART_FEM* is insignificant in the model. Taken together, the findings suggest that the gender of the audit partner do not have any significant influence over the ability of the partner to constrain earnings management.

Next, Table 11.12 below presents the moderating effects of audit partner tenure (*PART_TEN*) on the audit partner industry specialist ability to constrain earnings management. The experimental variable, which is *PART_TEN* represents a continuous variables coded between 0 and 3, measuring the partner tenure period between 2009 to 2011. Therefore, the maximum value for the partner tenure variable is capped at 3 years, so that the tenure is measured on an equal basis over the sample period. When the tenure of the audit partner (*PART_TEN*) is controlled for in the model, significant positive relationship is reported with *AEE*, suggesting that the longer is the partner tenure, the higher woud be the *AEE*, contributing to lower accruals quality. Nevertheless, these new findings suggest that *PART_TENURE* is also an important omitted variable in the main analysis on partner national-city framework for auditor industry specialisation. However, there is evidence to suggest that partner tenure moderates the relationship between partner industry specialist and earnings quality proxies used in the study as none of the partner industry expert variables are significant.

Table 11.11: *DAC_PER, AEE* and *PROFIT* Regression on the effect of the gender of industry specialist partner on earnings quality

		DAC_PERF				*AEE*				*PROFIT*			
Variables	**+/-**	**coef.**	**t-stat**	**p-value**	**sig.**	**coef.**	**t-stat**	**p-value**	**sig.**	**coef.**	**t-stat**	**p-value**	**sig.**
Intercept	-	0.123	1.550	0.061	*	0.176	2.820	0.003	***	-0.965	-1.160	0.123	
TA	+	-0.003	-0.310	0.380		-0.005	-0.670	0.250		0.172	1.600	0.055	*
PYTAC	+	0.025	1.080	0.140		-0.012	-0.880	0.190					
DE	-	-0.046	-1.410	0.079	*	0.005	0.150	0.439		0.081	0.190	0.423	
TAC	-									-1.777	-2.970	0.002	***
GROWTH	+	-0.005	-0.590	0.279		-0.002	-0.270	0.394		0.123	1.470	0.071	*
MB	+	0.002	1.320	0.093	*	0.000	0.240	0.405		0.015	1.210	0.113	
CFO	-	-0.199	-2.680	0.004	***	-0.030	-1.020	0.153		2.518	3.870	0.000	***
LOSS	+	0.012	0.520	0.304		0.008	0.770	0.222					
LAG_LOSS	-									-0.788	-6.630	0.000	***
ALTMAN	-	-0.002	-0.220	0.415		-0.009	-1.780	0.038	**	0.231	2.680	0.004	***
BLOCKOWN	+	-0.002	-0.200	0.421		0.001	0.200	0.422		-0.003	-0.050	0.481	
BIG4	-	-0.026	-1.150	0.125		-0.004	-0.260	0.396		-0.016	-0.090	0.463	
SECOND	-	-0.045	-1.890	0.030	**	-0.008	-0.500	0.309		0.085	0.520	0.302	
PART_FEM		0.015	0.810	0.420		-0.016	-1.200	0.229		-0.071	-0.380	0.352	
<u>*Industry Specialist Auditor*</u>													
PARJOINT_PARNAT#1-PARCITY#1		-0.020	-1.310	0.192		-0.021	-1.560	0.119		0.154	0.490	0.622	
PARCITY_ONLY		-0.006	-0.460	0.644		0.000	-0.010	0.991		-0.258	-1.650	0.098	*
PARNAT_ONLY													
<u>*Corporate Governance*</u>													
BODFEM		0.007	1.240	0.353		0.010	1.630	0.104		-0.001	-0.010	0.989	
BODFOREIGN		0.007	0.930	0.809		0.003	0.410	0.681		-0.086	-1.290	0.196	
INTAUD		-0.003	-0.240	0.299		-0.014	-1.160	0.247		0.179	1.230	0.219	
ACSIZE		-0.007	-1.040	0.798		-0.004	-0.850	0.395		0.016	0.220	0.823	
ACINDP		-0.003	-0.260	0.044**		0.016	2.590	0.010**		0.006	0.070	0.947	
ACFINEXP		0.012	2.010	0.737		-0.003	-0.550	0.583		0.012	0.210	0.831	
ACMEET		-0.002	-0.340	0.369		-0.001	-0.130	0.900		-0.032	-0.470	0.639	
Year fixed-effects			Included				Included				Included		
Industry fixed-effects			Included				Included				Included		
R^2			0.229				0.082				0.376		
N			1,019				924				1,019		

*** are significant at p<0.01, ** are significant at p<0.05 and *at p<0.10. All p-values are one-tailed. Industry fixed-effects and year fixed-effects are not reported for brevity, and t-statistics and significance levels are calculated using the White (1980) robust standard errors to correct for heteroscedasticity. Refer Table 5.8 for definition of variables.

Table 11.12: *DAC_PERF*, *AEE* and *PROFIT* Regression on the effect of the tenure of industry specialist auditor on earnings quality

		DAC_PERF				*AEE*				*PROFIT*			
Variables	**+/-**	**coef.**	**t-stat**	**p-value**	**sig.**	**coef.**	**t-stat**	**p-value**	**sig.**	**coef.**	**t-stat**	**p-value**	**sig.**
Intercept		0.132	1.660	0.048	**	0.165	2.650	0.004	***	-0.992	-1.190	0.117	
TA	+	-0.003	-0.310	0.380		-0.006	-0.720	0.237		0.173	1.600	0.055	*
PYTAC	+	0.024	1.070	0.143		-0.011	-0.830	0.203					
DE	-	-0.050	-1.500	0.067	*	0.010	0.270	0.396		0.089	0.210	0.415	
TAC	-									-1.768	-2.940	0.002	***
GROWTH	+	-0.005	-0.610	0.273		-0.002	-0.260	0.399		0.122	1.460	0.073	*
MB	+	0.002	1.280	0.100		0.000	0.310	0.379		0.016	1.240	0.108	
CFO	-	-0.197	-2.670	0.004	***	-0.033	-1.130	0.129		2.506	3.840	0.000	***
LOSS	+	0.012	0.500	0.310		0.008	0.790	0.217					
LAG_LOSS	-									-0.787	-6.640	0.000	***
ALTMAN	-	-0.002	-0.260	0.397		-0.008	-1.620	0.053	*	0.233	2.710	0.004	***
BLOCKOWN	+	-0.002	-0.240	0.404		0.001	0.310	0.380		-0.002	-0.030	0.487	
BIG4	-	-0.026	-1.170	0.122		-0.003	-0.210	0.419		-0.013	-0.080	0.468	
SECOND	-	-0.045	-1.880	0.031	**	-0.009	-0.520	0.301		0.082	0.500	0.308	
PART_TEN		-0.007	-0.740	0.462		0.011	1.750	0.080	*	0.011	0.130	0.897	
Industry Specialist Auditor													
PARJOINT_PARNAT#1-PARCITY#1		-0.019	-1.250	0.213		-0.022	-1.640	0.100		0.153	0.490	0.624	
PARCITY_ONLY		-0.006	-0.510	0.609		0.001	0.060	0.956		-0.255	-1.640	0.102	
PARNAT_ONLY													
Corporate Governance													
BODFEM		0.007	1.260	0.208		0.010	1.620	0.105		-0.001	-0.020	0.985	
BODFOREIGN		0.008	0.970	0.332		0.002	0.370	0.714		-0.087	-1.320	0.187	
INTAUD		-0.003	-0.190	0.847		-0.014	-1.210	0.228		0.176	1.210	0.225	
ACSIZE		-0.007	-1.070	0.286		-0.004	-0.830	0.409		0.017	0.240	0.812	
ACINDP		-0.002	-0.220	0.827		0.015	2.530	0.012	**	0.003	0.040	0.969	
ACFINEXP		0.011	1.990	0.047	**	-0.003	-0.490	0.626		0.014	0.240	0.813	
ACMEET		-0.002	-0.340	0.731		0.000	-0.060	0.955		-0.031	-0.460	0.645	
Year fixed-effects		Included				Included				Included			
Industry fixed-effects		Included				Included				Included			
R^2		0.229				0.083				0.376			
N		1,019				924				1,019			

*** are significant at p<0.01, ** are significant at p<0.05 and *at p<0.10. All p-values are one-tailed. Industry fixed-effects and year fixed-effects are not reported for brevity, and t-statistics and significance levels are calculated using the White (1980) robust standard errors to correct for heteroscedasticity. Refer Table 5.8 for definition of variables.

11.7 The fixed-effects model

It could be argued that the coefficient estimates produced by the main findings could be biased due to the omission of unobservable client characteristics (Minutti-Meza, 2013) that are not controlled for in the models. The extent of the client's preference for an industry expert partner could be an example of this unobservable client characteristic that is possibly correlated with the audit partner industry expertise indicator variables, other experimental variables and with the dependent variable, earnings quality in the models. According to Goodwin and Wu (2014), it is difficult to solved such problem using instrumental variables (IVs) in a two-stage least squares (2SLS) regression model due to unavailability of a suitable instrumental variable. Thus, following Goodwin and Wu (2014), dummy variables for client fixed-effects are included, in this section, in the regression models to address this possible endogeneity problem. It is assumed that the endogeneity bias problem will be corrected through the inclusion of the client fixed effects, which will capture any client related omitted variables that do not vary with time. On top of that, following Goodwin and Wu (2014) and Gul *et al*. (2013)[26], partner fixed-effects is also included in the model, using an indicator variable for each auditor who signs audit reports for multiple clients for multiple years. This is based on the argument that a partner's generic ability, which cannot be directly observed and measured, could also be an important correlated and omitted variable. In particular, generic ability could be positively correlated with the audit partner industry expertise indicator variables, other experimental variables and with the dependent variable, earnings quality. To the extent that the partner expertise experimental variables capture a partner's generic ability rather than his expertise within an industry, these experimental variables should be insignificant in the partner fixed-effect regressions. Therefore a fixed-effect model is also estimated, in Table 11.13 below for each of the *DAC_PERF*, *AEE* and the *PROFIT* model as follows:

For the *DAC_PERF* model, the inclusion of individual auditor indicators in the base model increases the explanatory power (R^2) from 22.9 percent in the base model in the Table 10.5 to 66.7 percent in the fixed-effect model in Table 11.3 below. However, the partner industry expertise variables remain insignificant at p=0.10. For the *AEE* model, the inclusion of individual auditor indicators in the base model increases the explanatory power (R^2) for the *AEE* model by about 45.9 percent, which is from 8 percent in the base model in Table 10.7 to 57.5 percent in the fixed-effect model in Table 11.13 below. However, despite the increase in the R^2, no significant change was observed in the *AEE* model as the partner industry expertise variables remain insignificant at any conventional level. In addition, for the *PROFIT* model in Table 11.13 below, the R^2 is 33 percent, which is lower as compared to the base model, where the R^2 reported was 37.5 percent. Despite that, all the partner industry expertise variables

[26] In their study, Gul *et al*. (2013) control for client, audit firm, branch office, and year effects, and time-varying client characteristics to separate the effects of individual auditors on audit quality from those of clients, audit firms, and audit offices, and individual auditors' effects on audit quality. The audit-quality measures used in their study are audit reporting (*AR*) aggressiveness, clients' abnormal accruals and non-core earnings, and the presence of a small profit.

Table 11.13: Fixed-effects regression for earnings quality models under partner national-city framework for auditor industry specialisation

		DAC_PERF				*AEE*				*PROFIT*			
Variables	**+/-**	**coef.**	**t-stat**	**p-value**	**sig.**	**coef.**	**t-stat**	**p-value**	**sig.**	**coef.**	**t-stat**	**p-value**	**sig.**
Intercept		-1.463	-1.490	0.068	*	0.059	0.080	0.467		21.600	1.830	0.034	**
TA	+	0.192	1.340	0.091	*	0.043	0.400	0.345		0.764	0.530	0.299	
PYTAC	+	-0.038	-0.770	0.221		-0.027	-1.550	0.061	*	1.978	1.020	0.154	
DE	-	-0.100	-0.480	0.315		0.236	1.400	0.081	*	-4.652	-2.760	0.003	***
GROWTH	+	0.003	0.200	0.420		-0.003	-0.200	0.422		1.360	3.580	0.000	***
MB	+	-0.001	-0.470	0.318		0.001	0.560	0.288		0.018	0.370	0.356	
CFO	-	-0.442	-2.310	0.011	**	-0.101	-1.100	0.136		5.103	3.060	0.001	***
LOSS	+	0.046	1.670	0.048	**	-0.005	-0.200	0.420		1.237	4.100	0.000	***
ALTMAN	-	0.070	0.940	0.175		0.017	0.250	0.403		-0.799	-0.920	0.178	
BLOCKOWN	+	0.026	1.570	0.059	*	0.010	0.870	0.193		-0.181	-0.800	0.211	
BIG4		0.030	0.280	0.390		0.053	0.880	0.190		-27.453	-12.740	0.000	***
SECOND		0.029	0.210	0.416		0.071	1.090	0.139		-6.350	-5.840	0.000	***
Industry Specialist Auditor													
PARJOINT_PARNAT#1 -PARCITY#1		-0.364	-1.470	0.143		-0.524	-1.270	0.419		-1.855	-0.810	0.204	
PARCITY_ONLY		-0.064	-1.380	0.169		-0.040	-1.110	0.790		-0.172	-0.270	0.268	
PARNAT_ONLY													
Corporate Governance													
BODFEM		0.001	0.110	0.913		0.019	1.370	0.860		-0.050	-0.180	0.171	
BODFOREIGN		-0.008	-0.280	0.781		-0.011	-0.660	0.002		1.226	3.140	0.512	
INTAUD		0.003	0.110	0.909		-0.002	-0.070	0.074		-1.128	-1.790	0.947	
ACSIZE		0.002	0.150	0.883		-0.011	-0.720	0.104		0.584	1.620	0.472	
ACINDP		0.011	0.580	0.565		0.008	0.550	0.559		0.171	0.580	0.580	
ACFINEXP		0.014	1.380	0.167		0.006	0.600	0.312		0.192	1.010	0.552	
ACMEET		0.012	0.640	0.524		0.015	1.030	0.482		-0.178	-0.700	0.306	
Year fixed-effects			Included				Included				Included		
Industry fixed-effects			Included				Included				Included		
Client fixed-effects			Yes				Yes				Yes		
Partner fixed effects			Yes				Yes				Yes		
R^2			0.667				0.575				0.333		
N			1,019				824				1,019		

*** are significant at p<0.01, ** are significant at p<0.05 and *at p<0.10. All p-values are one-tailed. Industry fixed-effects, year fixed-effects, client fixed-effects and partner fixed-effects are not reported for brevity, and t-statistics and significance levels are calculated using the White (1980) robust standard errors to correct for heteroscedasticity. Refer Table 5.8 for definition of variables.

remain insignificant as per the main analysis reported earlier. Taken together, the inclusion of the partner fixed-effects do not alter significantly our overall conclusion on the effect of audit partner expertise on earnings quality, as the results are not significant throughout all the models examined in the study.

11.8 Alternative definition for corporate governance variables

This analysis aims to examine whether the findings for corporate governance reported in the main analysis in Chapter 10 are robust to alternative measures of board diversity and audit committee variables. Results are presented in Table 11.14 below. The results for the alternatives definitions of corporate governance variables are presented separately in Panel A for *DAC_PERF* regression, Panel B for *AEE* regression and Panel C for *PROFIT* regression. Each of the panels presents the analysis under the firm national-city framework, partner national-city framework and joint firm-partner national-city framework. The definition for each of the corporate governance variables are as follows:

There are four dummy variables created for board diversity. *BODFEM dummy1* (*BODFEM dummy1*) is an indicator variable for only one female director (foreign director) on the board, and 0 if otherwise. Whereas *BODFEM dummy2* (*BODFOREIGN dummy2*) is an indicator variable when more than a quarter of the board composition is comprised of female directors (foreign directors), and 0 if otherwise. *BODFEM dummy2* is positively significant ($p<0.10$) in Panel B for the *AEE* regression across the firm, partner and joint firm-partner national-city framework analyses, suggesting that companies with more than a quarter of the board comprised of female directors have higher accrual estimation error. This indicates that more female directors on board lead to poor board monitoring in the financial reporting process. *BODFOREIGN dummy1* and *BODFOREIGN dummy2* are negatively significant at $p<0.10$ in Panel C of the *PROFIT* regression, suggesting that the likelihood of companies reporting a loss rather than a profit is higher when either only one or more than a quarter of the board is comprised of foreign directors.

In respect of audit committee characteristics, the variable is further tested using the following dummy variables; 1) *ACSIZE dummy* which is coded 1 for audit committee with at least three members, 0 if otherwise; 2) *ACINDP dummy* which is coded 1 for audit committee comprised of fully independent non-executive directors, 0 if otherwise; 3) *ACFINEXP dummy* which is coded 1 for audit committee with at least one member with accounting and finance background/qualification, 0 if otherwise; 4) *ACSVEXP* which represents the proportion of audit committee members with supervisory experience[27], and 5) *ACMEET dummy* which is coded 1 for audit committee that meet at least three times per annum. Interestingly, *ACIND dummy* is positively significant ($p<0.05$) in two out of three models under Panel B of the *AEE* regression, suggesting that companies with fully independent audit committee reports higher accrual estimation error (lower accrual quality). This finding is consistent

[27] Following DeFond *et al.* (2005) and Dhaliwal *et al*. (2010), supervisory expertise refers to non-financial expertise such as experience as a CEO or Chairman of a company.

with the results reported in the main analysis for the *AEE* in Table 10.7 and 10.13 when the audit partner is controlled for in the analysis. On the other hand, *ACFINEXP dummy* is reported to be negatively significant ($p<0.10$) in all the three estimations in Panel C, suggesting that companies with audit committee comprised at least one financially expert member is more conservative in their profit reporting, as they are more likely to report a loss rather than a profit.

Alternatively, following Zaman (2011), the four audit committee variables are decomposed into an audit committee effectiveness (*ACE*) index, to examine their effect collectively on earnings quality. Audit committee is considered effective when it meets all the four criteria sets by the U.K. Corporate Governance Code: 1) comprised of minimum three members, 2) members are fully independent, 3) at least one member with a recent and relevant financial experience and 4) meet at least three times a year. Nevertheless, there is no significant evidence to support the contention that more effective audit committee contributes to higher earnings quality.

Table 11.14: *DAC_PERF, EAA* and *PROFIT* Regression with alternative definition of corporate governance variables

Panel A: *DAC_PERF* Regression

		Firm national-city framework				**Partner national-city framework**				**Joint firm-partner national-city framework**			
Variables	**+/-**	**coef.**	**t-stat**	**p-value**	**sig.**	**coef.**	**t-stat**	**p-value**	**sig.**	**coef.**	**t-stat**	**p-value**	**sig.**
BODFEM dummy1		0.006	0.710	0.480		0.013	1.230	0.220		0.013	1.270	0.205	
BODFEM dummy2		0.007	0.470	0.636		0.017	0.930	0.351		0.018	1.000	0.316	
BODFOREIGN dummy1		0.009	1.040	0.300		0.006	0.580	0.561		0.007	0.670	0.500	
BODFOREIGN dummy2		0.017	1.360	0.175		0.015	0.980	0.330		0.014	0.940	0.348	
ACSIZE dummy		-0.012	-1.120	0.264		-0.011	-0.860	0.389		-0.011	-0.800	0422	
ACINDP dummy		0.002	0.120	0.903		0.001	0.070	0.941		0.002	0.110	0.912	
ACFINEXP dummy		0.014	0.810	0.421		0.021	1.040	0.298		0.022	1.080	0.280	
ACSVEXP		-0.002	-0.300	0.763		0.000	0.050	0.957		0.000	0.060	0.953	
ACMEET dummy		-0.001	-0.130	0.899		0.002	0.160	0.874		0.003	0.190	0.847	
ACE		0.003	0.320	0.747		0.004	0.340	0.369		0.005	0.420	0.675	

Panel B: *AEE* Regression

		Firm national-city framework				**Partner national-city framework**				**Joint firm-partner national-city framework**			
Variables	**+/-**	**coef.**	**t-stat**	**p-value**	**sig.**	**coef.**	**t-stat**	**p-value**	**sig.**	**coef.**	**t-stat**	**p-value**	**sig.**
BODFEM dummy1		0.006	0.660	0.507		0.011	1.150	0.251		0.012	1.230	0.219	
BODFEM dummy2		0.034	1.670	0.095	*	0.040	1.670	0.095	*	0.042	1.770	0.078	*
BODFOREIGN dummy1		0.006	0.730	0.468		0.003	0.320	0.748		0.003	0.300	0.766	
BODFOREIGN dummy2		0.011	0.810	0.420		0.008	0.750	0.455		0.008	0.740	0.459	
ACSIZE dummy		0.004	0.390	0.698		-0.005	-0.530	0.600		-0.006	-0.490	0.624	
ACINDP dummy		0.020	1.540	0.124		0.027	2.390	0.017	**	0.026	2.310	0.021	**
ACFINEXP dummy		0.023	1.600	0.110		0.015	1.010	0.312		0.015	0.990	0.324	
ACSVEXP		-0.003	-0.650	0.517		0.000	-0.030	0.975		0.000	0.060	0.950	
ACMEET dummy		-0.007	-0.510	0.612		-0.006	-0.470	0.635		-0.007	-0.490	0.623	
ACE		-0.003	-0.300	0.761		-0.001	-0.120	0.902		-0.002	-0.200	0.843	

Panel C: *PROFIT* Regression

		Firm national-city framework				**Partner national-city framework**				**Joint firm-partner national–city framework**			
Variables	**+/-**	**coef.**	**t-stat**	**p-value**	**sig.**	**coef.**	**t-stat**	**p-value**	**sig.**	**coef.**	**t-stat**	**p-value**	**sig.**
BODFEM dummy1		0.005	0.040	0.966		-0.050	-0.400	0.689		-0.050	-0.390	0.696	
BODFEM dummy2		0.170	0.660	0.507		0.233	0.770	0.440		0.169	0.560	0.575	
BODFOREIGN dummy1		-0.148	-1.590	0.111		-0.175	-1.700	0.090	*	-0.145	-1.390	0.164	
BODFOREIGN dummy2		-0.159	-1.440	0.150		-0.215	-1.760	0.079	*	-0.205	-1.660	0.097	*
ACSIZE dummy		0.021	0.190	0.846		-0.087	-0.700	0.483		-0.097	-0.780	0.438	
ACINDP dummy		-0.013	-0.090	0.926		0.009	0.060	0.952		0.010	0.070	0.948	
ACFINEXP dummy		-0.320	-1.850	0.065	*	-0.502	-2.510	0.012	**	-0.503	-2.500	0.012	**
ACSVEXP		0.028	0.570	0.571		0.014	0.240	0.812		0.011	0.190	0.848	
ACMEET dummy		0.116	1.060	0.144		0.034	0.270	0.787		0.041	0.320	0.747	
ACE		0.134	1.260	0.208		0.029	0.230	0.818		0.034	0.270	0.791	

*** are significant at p<0.01, ** are significant at p<0.05 and *at p<0.10. All p-values are one-tailed, except for corporate governance variables which are two-tailed. Industry fixed-effects and year fixed-effects are not reported for brevity, and t-statistics and significance levels are calculated using the White (1980) robust standard errors to correct for heteroscedasticity. Refer Table 5.8 for definition of variables.

CHAPTER 12

CONCLUSIONS, LIMITATIONS AND FUTURE RESEARCH

12.1 Conclusions

A study on auditor industry specialisation, corporate governance, audit quality and earnings quality remains important to policy-makers, investors and regulators. This is because the quality of company reported earnings affects investors' confidence and allocation of resources in the financial markets. Company reported earnings are prone to management legitimate manipulations, and the functions of corporate governance and external auditing serve as direct monitoring mechanisms of the company's financial reporting processes. As these two functions also potentially have a direct impact on the degree of earnings management exercised by the companies' management, the importance of their role and effectiveness cannot be overemphasised.

The governance reforms following the 2007/2008 financial crisis (e.g. the implementation of the U.K. Corporate Governance Code, the U.K. Stewardship Code and the Audit Firm Governance Code in 2010) aim to improve the quality of governance and audit in the public listed companies, given that directors and auditors have been heavily criticised and blamed for lack of diligence which has contributed to the crisis. Furthermore, the motivation for earnings management is higher during a financial crisis period due to the unstable economic and financial conditions as well as pressure to keep in business and improve their performance in the public equity market. Thus, the financial crisis itself (starting around the year 2007/2008) makes it an interesting setting to analyse the effect of industry specialist auditors and corporate governance on audit quality and earnings quality during that period. Doing so, it also provides an opportunity to check whether the findings would turn out differently as compared to prior studies carried out during the non-crisis period. Also, research in the corporate governance area using more recent data is important, considering the changing financial reporting landscape and regulatory environment which has impacted the role played by corporate governance and external auditors.

This current thesis examines two empirical propositions. Firstly, the study examines the effect of industry specialist auditors and corporate governance on audit fees and audit quality. Secondly, the study investigates the effect of industry specialist auditors and corporate governance on earnings quality. Thus, the study is important to researchers, regulators and practitioners as it explores both the perceived corporate governance effectiveness and perceived audit quality (based on the level of audit fees charged by the auditor) and also the actual governance effectiveness and audit quality, based on the quality of earnings reported by the clients of the industry specialist auditors. The study's research questions have been examined under three different levels of analysis for auditor industry specialisation: 1) the firm national-city framework, 2) the partner national-city framework, and 3) the joint firm-partner national-city framework. The corporate governance characteristics examined are female directorship, foreign directorship, internal audit function, and audit committee characteristics relating to size, independence, expertise and activity. The earnings quality proxies examined in the study are the discretionary accruals, the accrual estimation error and the likelihood of reporting a profit (or avoiding a loss).

Findings from the first empirical study in Chapter 7 suggest that the audit partner industry leadership at the national level drives the fee premium for auditor industry specialisation in the U.K., above and beyond the audit firm industry leadership. This supports the argument that industry expertise is uniquely attributable to the individual audit partner's human capital in terms of their knowledge and experience gained from leading the audit engagements in a particular industry. This audit partner's expertise could not be easily and completely transferable to other audit partners or staff within the same audit office or the same audit firm. However, the fact that non-specialist partners within the leading audit firms are also able to charge a fee premium suggests the existence of at least weak knowledge sharing and transfer of industry expertise between the partners within the Big 4 audit firms.

In addition, findings from the various robustness tests performed in Chapter 8 indicate that the fee premium for auditor industry specialisation in the U.K. earned by those audit firms which enjoy the joint national and city industry leadership is not merely due to their successful differentiation strategy, but is also partly driven by the fee pressure from their closest competitor in the city-industry audit market. Nevertheless, the audit firm's position as a joint national and city industry leader in the U.K. already gives it sufficient market power to extract a fee premium. This is because there is a distinct (non-interdependency) fee premium attached either to the audit firm's joint national and city industry leadership or to its distance to the closest competitor. Also, female partners are found to have the ability to charge higher fee premiums as compared to male partners. There is no evidence of fee discount reported in the study.

In respect of the effect of corporate governance on audit quality, the results indicate that foreign directors and active audit committees demand additional and extensive audit effort from their auditors in order to certify their monitoring function, resulting in the charging of higher audit fees. However, there is no consistent evidence that female directorship, presence of internal audit function, and audit committee financial expertise are associated with higher or lower audit fees, whereas, audit committee size and independence have never been significant in any analysis performed. Besides this, in the robustness test using the alternative definition of corporate governance, this study also finds evidence that audit fees are higher for companies with 1) more than a quarter of the board composition comprised of female directors, 2) when a dummy variable for only one foreign director on the board is used, and 3) when more than a quarter of the board composition is comprised of foreign directors. Based on the sensitivity and robustness analysis in Chapter 8, the results for the main analysis are robust to alternative regression estimators, alternative definitions of industry specialist auditors, and are consistent in the presence of endogeneity.

Next, the findings from the second empirical study discussed in Chapter 10 suggest that audit firm industry leadership plays a more important role than audit partner industry leadership in promoting higher earnings quality, as evidenced by lower discretionary accruals, lower accrual estimation error and higher likelihood of reporting a loss rather than a profit. Also, from the robustness test in Chapter 11, the study has found no evidence to suggest that female partners or partners with longer tenure are more effective in promoting earnings quality. In addition, the study has documented that competitive pressure has an adverse effect on earnings quality. This is based on the evidence that discretionary accruals and accrual estimation error are larger when the distance between the audit firms with its closest competitor is smaller.

In addition, the study also finds that female director as well as the audit committee's financial expertise and independence contribute to accruals manipulation through larger magnitude of discretionary accruals and higher accrual estimation error. This finding is interesting given the data was tested in the period following the 2007/2008 financial crisis, suggesting that the corporate governance mechanisms are not effective in constraining earnings management, but somehow the effect is moderated by the role of industry specialist auditors. In addition, audit committee size and audit committee meetings constrain income-increasing discretionary accruals. The use of alternative definitions to measure the corporate governance variables seems to have produced mixed results.

Based on the sensitivity and robustness analysis in Chapter 11, the results for the main analysis seem to be robust to alternative regression estimators, alternative definitions of industry specialist auditors, as well as when using the firm fixed-effects and partner fixed-effects model.

Overall, the consistent evidence between fee premium and higher earnings quality offered by industry specialist auditors support the product differentiation theory and reputation theory, which suggest that auditors differentiate themselves through industry specialisation to meet clients' demands for better financial reporting quality, and this differentiation strategy is valued in the audit market as it is priced at a differentially higher rate than the Big 4 brand name reputation premium. Findings for the corporate governance analyses are consistent with institutional theory or managerial hegemony theory, where the role of the board was viewed to be a passive one and more ceremonial in nature during the sample period investigated, as there is no evidence to suggest that they effectively constrain the earnings management practices in the U.K public listed companies.

The findings are of potential interest to researchers, policy makers, practitioners and investors as the issues relating to audit quality, earnings quality and corporate governance are pertinent for investor protection in the financial market. For researchers, this study shows that industry leadership measured at the partner level better captures the concept of the audit fee premium compared to the leadership measured at the firm or office level. Therefore, tests based on partner-level industry leadership should be more powerful in detecting the effects of auditor industry expertise, and the estimates from office-level variables should be treated cautiously when relevant partner-level variables are not controlled for.

For the practitioners, this study provides investors and regulators an understanding of the differential level of audit quality among the Big Four industry specialist auditors, and that there is quality differential when the industry leadership is driven by the national, city-specific or partner level. For the audit firms, this study provides insights on how the different sources of auditor industry specialisation have an effect on audit fee premiums, and whether the existence and magnitude of such premiums in turn translates into higher audit quality. The evidence from this study suggests that the fee premium for partner industry leadership is economically important. Therefore, it pays for an individual auditor to invest in industry specialisation and build his/her reputation as an industry expert. Moreover, given the fee premium associated with individual partners' expertise and the lack of evidence on within-office knowledge transfers, developing more effective mechanisms to facilitate knowledge transfer between partners and create a broader reputation for industry expertise should be a profitable strategy for accounting firms.

Finally, in several countries, there is an on-going policy debate on whether the engagement partner's signature on the auditor's report should be mandated. Findings from this study suggest that the U.K. audit market values engagement partners' industry expertise. This behaviour implies that audits performed by expert partners are perceived to be more credible and thus more effective in reducing agency costs and, correspondingly, that clients are willing to pay higher audit fees for partner-specific expertise. Clearly, such a mechanism hinges on the availability of information regarding the identities of engagement partners as well as their market leadership before considering other costs involved. A direct benefit from public disclosure of the engagement auditor's signature is to enable users of financial reports to infer the industry expertise of engagement partners. Such a disclosure requirement can also encourage engagement auditors to develop their industry expertise.

For the regulators and policy makers, this study also provides an assessment of the effectiveness of the recent governance reforms through their impact on financial reporting quality. For the publicly listed companies, this study sheds light on the effectiveness of the role of corporate governance and industry specialist auditors in improving the quality of audit and financial reporting.

12.2 Limitations of the study

This study is subject to several limitations:

1) There is a risk that the audit fee model and the various earnings quality models used in the analyses in the preceding chapters suffer from omitted variables bias. This is because not all corporate governance characteristics are being included in the model. Besides this, different characteristics may interact with one another in a manner too complex to identify, thus producing possibly biased results.

2) The finding of auditor industry specialisation in this study is not robust to alternative measures of market shares based on number of clients, clients' total sales and clients' total assets.

3) The market share measures approach used to measure auditor industry specialisation could be subject to measurement error, since actual industry expertise is not directly observable from archival data (Reichelt and Wang, 2010).

12.3 Avenues for future research

The following are the suggestions for future research:

1) While this study focuses on the main effect of industry specialist auditors and corporate governance on audit quality and earnings quality, it does not provide evidence of whether industry specialist auditors (at the firm and partner level) can help boards and audit committees to increase their monitoring effectiveness, which can be regarded as the benefits of hiring industry specialists. Thus, for future research, it may be worthwhile investigating the interaction effect among different corporate governance characteristics and the industry specialist auditor variables to examine whether auditor industry specialisation complements or substitutes the governance role of the board.

2) It may be worthwhile to examine the effect of the individual partner demographic characteristics such as age, education background, and location, on both the fee premium and earnings quality, particularly in the U.K., when the partner signature disclosure is still new and very little is known about the individual partner effects on audit quality.

3) Finally, future research could examine the effect of audit partner tenure in the U.K. This is because the partner tenure period measurement is too short to be insightful in this current study as data on audit partners is only available since 2009, and the earliest sample year for the dataset is 2011. Therefore, the maximum value for the partner tenure variable is capped at three years, so that the tenure is measured on an equal basis over the sample period. Future

research could try to examine partner tenure in the U.K. over a longer duration of years (e.g. studies on audit partner tenure in the U.S. which reported significant effects include Gul *et al*. (2013) and Bedard and Johnstone (2010)).

4) The analyses are carried out during the global financial crisis period, and therefore more work is required in the future in this area to ascertain whether the current study's results are valid in the long-term.

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