Journal of International Accounting, Auditing and Taxation 20 (2011) 32–44

Contents lists available at ScienceDirect

Journal of International Accounting, Auditing and Taxation

Audit firm industry specialization and the audit report lag

Ahsan Habib[a,*], Md. Borhan Uddin Bhuiyan[b]

[a] Department of Accounting, Faculty of Business and Law, Auckland University of Technology, Auckland 1142, New Zealand
[b] Division of Commerce, Lincoln University, Christchurch, New Zealand

ARTICLE INFO

Keywords:
Audit report lag
Auditor industry specialization
National-level industry specialist
International Financial Reporting Standards (IFRS)

ABSTRACT

This paper contributes to the audit report lag (ARL) literature by documenting the association between audit firm industry specialization and the ARL. ARL is one of the few externally observable audit output variables that allows outsiders to gauge audit efficiency, because it relates to the timeliness of both audit and earnings information. Although a sizable volume of literature exists on the determinants of the ARL in different countries, the effect of audit firm industry specialization on the ARL has not been investigated. Industry-specialist auditors are able to develop industry-specific knowledge and expertise and to familiarize themselves quickly with the clients' business operations and, therefore, are likely to complete the audit sooner than their non-specialist counterparts. Using regression analyses with two different definitions of industry specialization, and controlling for known determinants of ARL, we demonstrate that the ARL is shorter for firms audited by industry specialist auditors. Our findings also reveal that the adoption of International Financial Reporting Standards (IFRS) has increased the ARL for all auditors except for industry specialist auditors.

1. Introduction

This paper contributes to the audit report lag (hereafter ARL) literature by documenting the association between audit firm industry specialization and the ARL. ARL is defined as the period between a company's fiscal year end and the audit report date, and it is one of the few externally observable audit output variables that allow outsiders to gauge audit efficiency (Bamber, Bamber, & Schoderbek, 1993). Because the audit report contains the auditor's opinion regarding the credibility of the financial statements, investors generally prefer shorter ARLs because the earlier they receive the audit opinion, the more rapidly they can adjust their investment preferences.[1] Since the ARL is expected to vary cross-sectionally because of firm and audit-specific characteristics, an understanding of the possible determinants of the ARL likely will provide insights into audit efficiency.

Prior research on the ARL focuses on identifying and expanding the set of variables likely to explain the ARL in the US as well as in countries outside the US. General findings from this research indicate that the ARL is affected by the complexity of the audit (e.g., number of subsidiaries), client size, client financial condition (operationalized by a bankruptcy prediction model), and type of earnings information (Ashton, Willingham, & Elliott, 1987; Bamber et al., 1993; Carslaw & Kaplan, 1991; Ng & Tai, 1994). However, the role of auditor industry specialization as a determinant of ARL has not been examined.

* Corresponding author.
E-mail addresses: ahsan.habib@aut.ac.nz (A. Habib), Md.Bhuiyan@lincolnuni.ac.nz (Md.B.U. Bhuiyan).

[1] Prior research on the information content of audit opinions reveals a negative market reaction to qualified audit opinions (Dopuch, Holthausen, & Leftwich, 1986; Dodd, Dopuch, Holthausen, & Leftwich, 1984) and a monotonic decline in earnings response coefficients (hereafter ERC) after the issuance of 'subject to' and 'consistency' audit qualifications (Choi & Jeter, 1992).

1061-9518/$ – see front matter © 2010 Elsevier Inc. All rights reserved.
doi:10.1016/j.intaccaudtax.2010.12.004

Archival research shows that industry-focused audit firms' investment in technologies, physical facilities, personnel, and organization control systems improves the quality of audits for the firms' focal industries (Krishnan, 2003, 2005; Balsam, Krishnan, & Yang, 2003; Mayhew & Wilkins, 2003; Kwon, Lim, & Tan, 2007). Because industry specialist auditors develop industry-specific knowledge, it is expected that they will be able to complete the audit sooner than non-specialist auditors because of increased efficiency.

Using a sample of New Zealand Stock Exchange (hereafter NZX) listed companies from 2004 to 2008, we find evidence that the clients of industry specialist auditors have shorter ARLs. The result holds after controlling for the self-selection problem associated with auditor choices. The self-selection problem arises because ARLs are observable only after a firm has chosen an auditor, while the ARL under an alternative auditor choice remain unobserved. This makes the choice of industry specialist auditor an endogenous variable and hence requires the control for self-selection problem. We measure industry specialization as the proportion of market share in terms of audit fees earned by respective audit firms in the NZX-defined industry classification groups. We also examine the effect of the adoption of the International Financial Reporting Standards (hereafter IFRS) on the ARL, and find that the ARL increased after the mandatory adoption of IFRSs for all clients except those audited by industry specialist auditors. The paper proceeds as follows: the next section provides a theoretical framework for incorporating audit firm industry specialization as a determinant of the ARL and reviews the relevant literature; Section 3 explains the research design; Section 4 provides test results supplemented by a number of sensitivity analyses, and the final section concludes.

2. Theoretical framework

The classic agency problem between shareholders and corporate managers gives rise to the hiring of auditors who provide independent assurance to the investors that the firm's financial statements conform to Generally Accepted Accounting Principles (GAAP; Watts & Zimmerman, 1983, 1986). One of the audit quality dimensions that differentiates high quality auditors from their low quality counterparts is the degree of audit firm industry specialization. Industry specialist auditors are able to spread industry-specific training costs over more clients, producing economies of scale that are not easily duplicated by non-specialists (Mayhew & Wilkins, 2003) *KPMG Peat Marwick's* 1993 restructuring along industry service lines is argued to be the initiator of industry-based audit firm market strategy formulation. The incentive for audit firms in general to become specialists is primarily due to a growing emphasis on understanding the client's business as suggested by the worldwide professional standards. A review of the prominent audit firm websites in New Zealand confirms the industry-focused nature of their professional services. KPMG, for example, claims that,

> "Drawing on our industry knowledge allows us to understand our clients' unique business issues and quickly respond with clear and practical business advice. Our industry professionals combine local and global experience with the latest technical and industry knowledge to help clients achieve sustainable business performance." (http://www.kpmg.co.nz/pages/101638.html)

PWC maintains that,

> "The depth of our industry expertise, like our international perspective, is an attribute that our clients value highly. We invest significant resources in building and sharing such expertise. We organise around industries to share the latest research and points of view on emerging industry trends, develop industry-specific performance benchmarks based upon global best practices. . ." (http://www.pwc.com/nz/en/industries/index.jhtml)

A sizable body of archival research has examined the impact of auditor industry specialization on different proxies for financial reporting quality (hereafter FRQ). Fig. 1 summarizes the domain of industry specialist audit research. Firms audited by industry specialist auditors report lower levels of absolute discretionary accruals (Krishnan, 2003; Balsam et al., 2003; and Velury, 2003 in the US, and Kwon et al., 2007 internationally); increased earnings conservatism (Krishnan, 2005); reduced propensity for the earnings to just meet or beat analysts' forecasts (Payne, 2008); improved disclosure quality (Dunn & Mayhew, 2004); enhanced predictability of earnings as measured by analyst earnings forecast accuracy and dispersion (Behn, Choi, & Kang, 2008); fewer earnings restatements (Romanus, Maher, & Fleming, 2008); and a higher *ERC* (Kwon et al., 2007) compared to the clients of non-specialist auditors.[2]

Experimental evidence also reports beneficial effects of industry-specialist auditors, attributed to a comprehensive understanding of companies' error characteristics (Hammersley, 2006; Maletta & Wright, 1996; Solomon, Shields, & Whittington, 1999); industry-specific tasks (Owhoso, Messier, & Lynch, 2002; Taylor, 2000); and increased performance gains (Dowling & Moroney, 2008). Moroney (2007) conducts an experiment between superannuation and manufacturing fund specialists to determine the relative efficiency of the industry specialist auditors. Superannuation specialists were found to be more efficient, because auditors encounter many of the same issues when moving from one client to another in that highly regulated

[2] Romanus et al. (2008) also find that firms that engage industry specialist auditors are less likely to have restatements that impact core operating accounts, consistent with the conjecture that ". . .industry specialist auditors are most concerned with those accounts that are highly critical in elucidating the firms' ongoing business operations, and hence provide more insight into its permanent earnings." [p. 4].

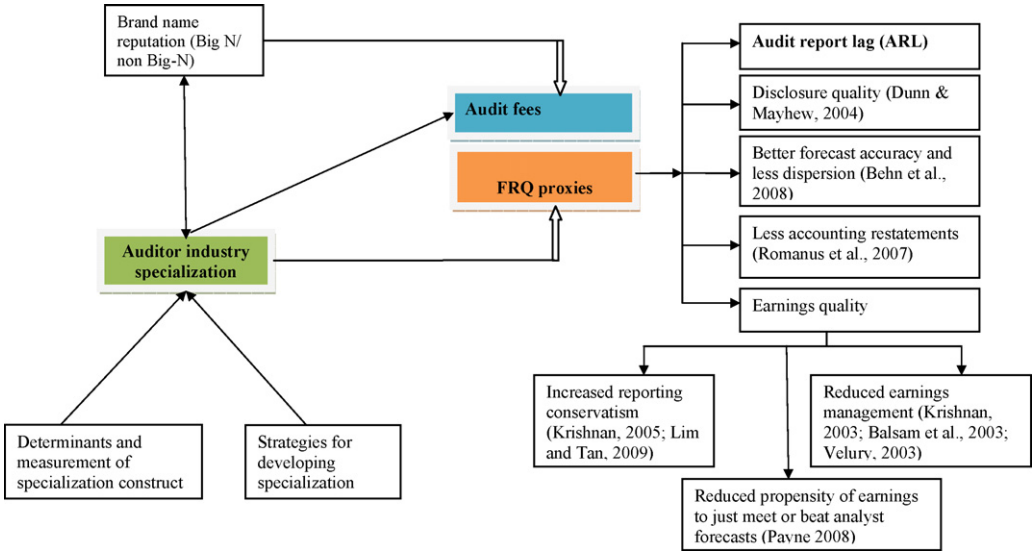

Fig. 1. Schematic representation of the consequences of auditor industry specialization.

industry. However, this was not the case for manufacturing specialists, who experience significant operational variation between clients within the same industry.

This paper links audit firm industry specialization to the ARL, one of the readily observable audit output variables. Bamber et al. (1993) suggest that research on the determinants of the ARL is important because (i) the ARL affects the timeliness of both audit and earnings information; and (ii) a better understanding of what factors drive the ARL is likely to provide more insights into audit efficiency. Existing research on the determinants of the ARL has been conducted in different countries around the world including New Zealand (Carslaw & Kaplan, 1991; Courtis, 1976; Gilling, 1977; Walker & Hay, 2007); Australia (Davis & Whittred, 1980; Dyer & McHugh, 1975; Whittred & Zimmer, 1980; Whittred & Zimmer, 1984); the US (Ashton et al., 1987; Bamber et al., 1993; Knechel & Pyne, 2001; Lee, Mande, & Son, 2009; Schwartz & Soo, 1996); Hong Kong (Jaggi & Tsui, 1999; Ng & Tai, 1994); Canada (Ashton, Graul, & Newton, 1989; Ashton & Newton, 1989); France (Soltani, 2002); Egypt (Afify, 2009); and Greece (Leventis, Weetman, & Caramanis, 2005).

Early research investigates the association between the ARL and a common set of firm characteristics, including firm size, fiscal year-end, loss occurrence, presence of extraordinary items, client complexity, auditor size, and audit opinion. Firm size is negatively associated with the ARL, implying that larger firms have shorter ARLs. On the other hand, firms characterized by loss occurrence, presence of an extraordinary item, and client complexity (number of subsidiaries) tend to have longer ARLs. Some other characteristics, such as probability of bankruptcy, ownership concentration, fiscal year-end, do not yield consistent evidence. Auditor-provided non-audit services (NAS) also have been used as an additional explanatory variable (Knechel & Pyne, 2001; Lee et al., 2009). Results reveal a negative association with the ARL, implying that NAS create knowledge spillover benefits that yield shorter ARLs. Lee et al. (2009) also document that longer audit tenure is associated with a shorter ARL.

One important characteristic of these studies relates to the overall explanatory power of the ARL model, which is modest at the 20–30% range. This fact provides an opportunity for researchers to incorporate additional variables not previously investigated, in the expectation of providing a more complete ARL model. Afify (2009) includes explanatory variables relating to corporate governance characteristics in Egypt, and reports a much higher adjusted R^2 of 57%; board independence, duality of the CEO, and the existence of an audit committee significantly affect the ARL. In New Zealand, Carslaw and Kaplan (1991) examine the association between the ARL and a set of explanatory variables including company control (owners versus manager control) and the proportion of debt. Findings reveal that audit delay is shorter for firms with manager-controlled structures. Walker and Hay (2007) extend the Carslaw and Kaplan (1991) study by incorporating auditor-provided NAS and the voluntary adoption of IFRS as additional determinants of the ARL in New Zealand. They find that NAS are associated with a shorter ARL and that voluntary adoption of IFRSs increases the ARL.

Taken together, extant research on the determinants of the ARL has identified a number of explanatory variables relevant to the ARL. This paper follows the same spirit and contributes to the ARL literature by incorporating auditor industry specialization as a possible determinant of the ARL. Industry expertise would be expected to result in shorter ARLs because of the shorter time required for industry-focused auditors to become familiarized with clients' financial reporting systems. Additionally, industry specialist auditors are more likely to resolve complex accounting issues earlier compared to their non-specialist counterparts because of their strong industry-focused knowledge. This, too, will allow the specialist auditors to issue audit reports sooner than the non-specialists. Based on these arguments we test the following hypothesis:

H_1. The presence of industry specialist auditors results in a shorter ARL as compared to the presence of non-specialist auditors.

We also test the moderating effect of industry specialization on the association between IFRS adoption and the ARL. In December 2002 the New Zealand Accounting Standards Review Board announced that New Zealand entities' financial reports will have to comply with IFRS from 1 January 2007. The adoption of IFRS will increase audit risks, because auditors now have to verify increased managerial judgments because of the principles-based standard-setting approach pursued by the International Accounting Standards Board (IASB). This increased risk is expected to require more audit effort and time and hence a longer ARL. However, such an effect may be less pronounced for industry specialist auditors because of their industry-specific knowledge enabling them to make better professional judgments and hence complete the audit sooner. We therefore propose the following:

H_2. The mandatory adoption of IFRS will increase the ARL but less so for firms audited by industry specialist auditors.

3. Research design

To test H_1, which investigates the association between audit firm industry specialization and the ARL, we perform the following regression analysis:

$$\begin{aligned}\mathrm{ARL} = {} & \eta_0 + \eta_1 \mathrm{FYE} + \eta_2 \mathrm{INDUM} + \eta_3 \mathrm{SIZE} + \eta_4 \mathrm{LOSS} + \eta_5 \mathrm{FINCOND} + \eta_6 \mathrm{SUB} + \eta_7 \mathrm{NAF} + \eta_8 \mathrm{STEN} \\ & + \eta_9 \mathrm{LTEN} + \eta_{10} \mathrm{OWNCON} + \eta_{11} \mathrm{SPEC} + \varepsilon \end{aligned} \tag{1}$$

To test H_2, which examines the effect of IFRS adoption on ARL, conditional on auditor industry specialization, the following extended regression model is also estimated:

$$\begin{aligned}\mathrm{ARL} = {} & \eta_0 + \eta_1 \mathrm{FYE} + \eta_2 \mathrm{INDUM} + \eta_3 \mathrm{SIZE} + \eta_4 \mathrm{LOSS} + \eta_5 \mathrm{FINCOND} + \eta_6 \mathrm{SUB} + \eta_7 \mathrm{NAF} + \eta_8 \mathrm{STEN} + \eta_9 \mathrm{LTEN} \\ & + \eta_{10} \mathrm{OWNCON} + \eta_{11} \mathrm{SPEC} + \eta_{12} \mathrm{IFRS} + \eta_{13} \mathrm{SPEC} \times \mathrm{IFRS} + \varepsilon \end{aligned} \tag{2}$$

Our primary coefficients of interest are η_{11} and η_{13}, in Eqs. (1) and (2) respectively, and we expect them to be negative.[3] The regression estimations also control for a number of other possible determinants of ARL, which will be discussed below.

3.1. Measurement of auditor industry specialization

We use two different measures of audit firm industry specialization at the national level to test both H_1 and H_2. Definition 1 (SPEC) measures industry expertise by auditor dominance (Mayhew & Wilkins, 2003; Reichelt & Wang, 2009). Dominant auditors differentiate themselves by investing in industry specific specialization costs, and by spreading such costs over more clients, making it difficult for competing auditors to mimic the same level of efficiency. SPEC is coded 1 if the (a) auditor has the largest market share in the respective industries; and (b) if its market share is at least ten percentage points greater than the second largest industry leader, and 0 otherwise. Definition 2 (SPEC30) measures industry expertise, assuming that such expertise increases with industry market share. SPEC30 is coded 1 if the auditor has a market share greater than 30% in the respective industries (Reichelt & Wang, 2009), and 0 otherwise.

Recent studies also have documented that auditor's city-specific industry expertise earns a fee premium (Basioudis & Francis, 2007; Ferguson, Francis, & Stokes, 2003) and improves clients' earnings quality (Reichelt & Wang, 2009). The distinction between national and city-specific industry specialization is important in countries like the USA and Australia because of their high degree of geographic dispersion among cities. Transferring national expertise to the city level is a difficult task in those jurisdictions. However, New Zealand is characterized by a low degree of geographic dispersion, which may enable audit firms to enjoy relatively easy transferability of national-level expertise to the city level. Furthermore, a majority of the audits are conducted in two cities, namely Auckland (61%) and Wellington (20%) resulting in a concentration of audit work in New Zealand and, therefore, provides further justification for national level analysis. However, given the anecdotal nature of the evidence for the easy transferability of national expertise to the city level in New Zealand, we also provide a supplementary analysis using city-level specialists to examine how such specialization affects the ARL.

We calculate audit firm industry-specialization in a given industry following the audit fee-based formula presented below:

$$\mathrm{ADTR\_MS}_{ik} = \frac{\sum_{j=1}^{J_{ik}} \mathrm{AF}_{ijk}}{\sum_{i=1}^{I_k} \sum_{j=1}^{J_{ik}} \mathrm{AF}_{ijk}} \tag{3}$$

[3] We exclude control variables like extraordinary items and audit opinion used in audit specialization research from our regression models because of a lack of cross-sectional variation among sample firms with respect to these two variables.

AF denotes audit fees received by the audit firms. The numerator is the sum of the audit fees of all J_{ik} clients of the audit firm i in industry k. The denominator is the audit fees of all J_{ik} clients in industry k, summed over all I_k audit firms.

3.2. Control variables

We provide a brief explanation of the control variables below.

3.2.1. Financial year-end (YREND)

In New Zealand, the two most common year-end dates are March 31 and June 30 and the period between these dates (and shortly after) is considered the busy season. We use a dummy variable equal to 1 if the company has a year-end that falls between March 31 and June 30 inclusive, and 0 otherwise, and predict a positive relationship between YREND and the ARL (Dyer & McHugh, 1975; Knechel & Pyne, 2001; Ng & Tai, 1994).

3.2.2. Industry (IND)

We use a dummy variable equal to 1 for companies belonging to the finance and investment sectors to proxy for industry classification, and expect a negative relationship with the ARL because such firms hold little inventory and fixed assets, and therefore are less complex to audit (Bamber et al., 1993). A sensitivity analysis is performed later to examine whether there are any significant ARL differences between regulated versus unregulated industries following prior research that documents differences in disclosure quality (Dunn & Mayhew, 2004) and change in audit market concentration (Hogan & Jeter, 1999) between these two group of industries.

3.2.3. Company size (SIZE)

We measure company size as the natural log of total assets. A negative relationship between company size and the ARL is expected because large firms are able to exert more pressure on auditors for timely reporting and, in addition, large firms may possess strong internal controls that the auditors can rely on, thus reducing the amount of audit work necessary at year-end.

3.2.4. Loss (LOSS)

Companies reporting a loss for each of the sample years are coded 1, as they are expected to have a longer ARL, (Ashton et al., 1989; Bamber et al., 1993; Carslaw & Kaplan, 1991; Courtis, 1976; Schwartz & Soo, 1996), as a result of the company wishing to delay the bad news and/or the auditor being more cautious during the engagement in response to greater risk. All other firm-year observations are coded 0.

3.2.5. Financial condition (FINCOND)

Following previous studies (Bamber et al., 1993; Jaggi & Tsui, 1999; Schwartz & Soo, 1996) we use the company's probability of bankruptcy, estimated from Zmijewski's (1984) bankruptcy prediction model, to proxy for financial condition.

$$\mathrm{ZFC} = -4.336 - 4.513(\mathrm{ROA}) + 5.679(\mathrm{FINL}) + 0.004(\mathrm{LIQ}) \tag{4}$$

where, ZFC is an estimate of Zmijewski's financial condition index, ROA is the return on assets (the ratio of net income to total assets), FINL is the financial leverage (the ratio of total debt to total assets), and LIQ is the liquidity (the ratio of current assets to current liabilities).

The higher (lower) the value of the index, the higher (lower) the likelihood of failure and the weaker (stronger) the company's financial condition. Companies with a weaker financial condition will expose the auditor to greater audit risk, thus increasing the ARL.

3.2.6. Subsidiaries (SUB)

We expect that companies with a significant number of subsidiaries will have longer ARLs because of the complexities inherent in auditing such companies. We use the number of principal subsidiaries held by the company as a proxy for complexity and diversification and expect a positive association between the two (Ng & Tai, 1994).

3.2.7. Non-audit service fees (NAS)

Research to determine whether NAS increase or decrease the ARL has produced mixed evidence. If knowledge spillovers occur, an auditor who performs NAS should be able to complete the audit work in a shorter period of time. However, empirical research has produced some evidence suggesting that increased NAS reduce auditor independence and ultimately reduces the FRQ (Ferguson, Seow, & Young, 2004; Frankel, Johnson, & Nelson, 2002). This view suggests that the lack of independence may result in reduced efficiency and a longer ARL. NAS is measured as the total amount of fees paid to the company's principal auditor that are not for audit work.

3.2.8. Tenure (TEN)[4]

Auditor tenure is based on the number of consecutive years a firm is audited by a particular audit firm. We use an indicator variable coded 1 for firm-year observations with auditor tenure less than or equal to three years and label it as short tenure (STEN), and 0 otherwise. Long auditor tenure (LTEN) is coded 1 when a firm is audited by the same audit firm for more than or equal to nine years, and 0 otherwise (Gul, Fung, & Jaggi, 2009; Lee et al., 2009). We expect a positive (negative) association between STEN (LTEN) and the ARL respectively, because the former group may require significant time to familiarize themselves with the company operations.

3.2.9. Ownership concentration (OWNCON)

Bamber et al. (1993) argue that, "The more widely held the client's shares, the greater the number of individual investors that rely on the client's financial statements. Greater reliance on the client's financial statements by diverse individual investors increases the client's (and auditor's) exposure to litigation [risk]... thereby increasing auditor business risk." Therefore, the ARL is expected to be a decreasing function of the client's ownership concentration.

3.2.10. IFRS mandatory adoption (IFRS)

Adoption of IFRS became mandatory for all listed NZ companies in January 2007. First time reporting under IFRS is expected to increase the ARL, as it will increase the amount of work auditors have to do to ensure compliance with the new standards, We use a dummy variable coded 1 if the financial year ends any time after January 2007, and 0 otherwise. Therefore we expect a positive relationship between IFRS and the ARL. However, such an effect is likely to be attenuated for firms audited by industry specialist auditors because of their industry expertise and audit production efficiency. Hence the interaction term SPEC × IFRS is expected to be negative.[5]

3.3. Sample selection

We use a sample of 502 firm-year observations from 2004 to 2008 based on New Zealand stock exchange listed companies having required data for all the test variables. The sample consists of companies listed on both the NZSX and New Zealand Alternative Market (NZAX). Data on audit report dates, audit fees, non-audit fees, audit tenure, name of the audit firm, number of subsidiaries and top five shareholders were manually collected from the annual reports of the sample companies retrieved from Investment Research Group (IRG) database. Other required financial statement data came from the DATASTREAM and was supplemented by annual reports, when required. The sample contains 105 unique firms.

4. Test results

4.1. Descriptive statistics and correlation analysis

Table 1 Panel A provides information on the 1st and 2nd ranked industry specialists in New Zealand over the sample period, followed by the descriptive statistics for the variables used in the empirical analysis in Panel B. Sample observations come from a number of industry categories. The consumer industry dominates overall, with 99 firm-year observations. Sample companies experience a mean (median) reporting delay of 61 (56) days respectively, with 22% of the sample observations reporting negative earnings.[6] The companies have an average of seven subsidiaries. Three quarters of the sample observations have a fiscal year end between March and June (inclusive). Thirty six percent (39%) of the sample observations are audited by top industry specialist auditors following definition 1 and 2 respectively. About 38% of the sample observations are characterized by an audit tenure of nine or more years. Panel C presents the correlation analysis, which reveals that the ARL is shorter for larger firms (−0.38) and firms audited by industry specialist auditors (−0.24). The ARL is longer for firms reporting negative earnings (0.44), suffering from weak financial conditions, audited by firms with short audit tenure, and for finance and investment sector firms (0.17). Pair-wise correlation among the independent variables reveals a significant negative association between LOSS and larger firms (−0.60). Firm size is significantly positively associated with NAF and NSUB (correlation coefficients of 0.42 and 0.40 respectively). This, however, does not represent any concern for multicollinearity, which is likely to be a concern only when pair-wise correlation between the two variables exceeds 0.80 (Gujarati, 1995).

4.2. Univariate analysis

Table 2 presents a univariate analysis of the mean differences of a number of variables between industry specialist and non-specialists. The ARL is much shorter for specialist firms and the difference is statistically significant at better than the

[4] While in Australia audit partners are required to sign the audit report, thereby enabling researchers to investigate audit tenure at the partner level, in New Zealand audit reports are signed by the audit firm rather than the partner. Therefore auditor tenure in this case is measured at the firm level rather than at the partner level.

[5] The increase in ARL because of first time adoption of IFRS may have resulted from both learning and increased judgment effect. However, it is difficult to isolate the impact of one over another using archival research design. We thank an anonymous reviewer for this insight.

[6] There are 41 firm-year-observations experiencing an ARL of more than 3 months. To ensure that the results are not driven by these outliers, we run a sensitivity analysis excluding observations with an ARL of more than 3 months. The results remain unchanged.

Table 1
Descriptive statistics.

Industry	1st ranked	2nd ranked	SPEC	SPEC30
(Panel A) 1st and 2nd ranked national industry specialist in New Zealand over the sample period				
Industrial/A01 Agriculture and Fishing	PWC	KPMG	Yes	Yes
Industrial/A02 Mining	PWC	KPMG	Yes	Yes
Industrial/A03 Forestry	PWC	–	Yes	Yes
Industrial/A04 Building	KPMG	PWC	Yes	Yes
Industrial/A05 Energy	KPMG	PWC	Yes	Yes
Industrial/A06 Food	E&Y	PWC	No	Yes
Industrial/A07 Textiles and Apparel	KPMG	–	Yes	Yes
Industrial/A08 Intermediate and Durables	PWC	E&Y	Yes	Yes
Industrial/A09 Property	PWC	Deloitte	No	Yes
Industrial/A10 Transport	Deloitte	E&Y	Yes	Yes
Industrial/A11 Ports	Deloitte	PWC	Yes	Yes
Industrial/A12 Leisure and Tourism	PWC	KPMG	Yes	Yes
Industrial/A13 Consumer	PWC	KPMG	Yes	Yes
Industrial/A14 Media and Communications	KPMG	–	Yes	Yes
Industrial/A15 Finance	PWC	Staples Roadway	Yes	Yes
Industrial/A16 Investments	PWC	KPMG	Yes	Yes

Variables	Mean	Median	S.D.	Maximum	Minimum
(Panel B) Descriptive statistics					
ARL	61	56	20	167	27
FYE	0.75	1	0.44	1	0
INDUM	0.18	0	0.38	1	0
SIZE	4.99	5.06	0.94	6.92	2.37
LOSS	0.22	0	0.41	1	0
FINCOND	−2.26	−3.12	8.48	168.83	−6.16
SUB	6.74	3	8.66	76	0
NAF	69,323	16,000	170,165	20,00,000	0
STEN	0.29	0	0.45	1	0
LTEN	0.38	0	0.49	1	0
OWNCON	0.52	0.51	0.22	0.94	0.06
SPEC	0.36	0	0.48	1	0
SPEC30	0.39	0	0.49	1	0
IFRS	0.41	–	–	–	–

Variables	ARL	YREND	INDUSTRY	SIZE	LOSS	NAF	NSUB	ZSCORE	STEN	LTEN	OWNCON	SPEC	SPEC30	IFRS
(Panel C) Correlation analysis														
ARL	1.00													
YREND	−0.04	1.00												
INDUM	0.17*	0.04	1.00											
SIZE	−0.38*	0.07	−0.21*	1.00										
LOSS	0.44*	0.01	0.22*	−0.60*	1.00									
NAF	−0.10*	0.07	−0.06	0.42*	−0.13*	1.00								
SUB	0.00	−0.05	−0.09**	0.40*	−0.13*	0.48*	1.00							
FINCOND	0.13*	0.05	0.06	−0.22*	0.23*	−0.01	−0.01	1.00						
STEN	0.17*	0.06	0.03	−0.20*	0.12*	−0.06	−0.13*	0.09**	1.00					
LTEN	−0.03	−0.20*	0.21*	0.05	−0.05	0.02	0.08**	−0.03	−0.50*	1.00				
OWNCON	0.03	−0.04	−0.17*	0.07	−0.07	0.03	0.14*	0.04	−0.05	0.02	1.00			
SPEC	−0.23*	0.01	−0.07**	0.37*	−0.16*	0.30*	0.14*	−0.04	−0.11*	−0.04	−0.01	1.00		
SPEC30	−0.23*	0.05	−0.10**	0.34*	−0.17*	0.28*	0.11*	−0.04	−0.05	−0.08**	0.05	0.93*	1.00	
IFRS	0.12*	0.01	0.01	0.08	0.06	0.02	0.08	−0.02	−0.23*	0.21*	0.02	0.02	0.01	1.00
IFRS × SPEC	−0.11*	0.00	−0.05	0.23*	−0.07	0.18*	0.15*	−0.02	−0.17*	0.12*	0.03	0.56*	0.53*	0.50*

Note: Following prior research, two different measures of audit firm industry specialization are employed in the current paper. Definition 1 (SPEC) defines a national industry specialist if (a) the auditor has the largest market share in the respective industries and (b) if its market share is at least ten percentage points greater than the second largest industry leader. Definition 2 (SPEC30) measures industry expertise assuming that such expertise increases with industry market share. Specifically, Definition 2 defines a national industry specialist if the auditor has a market share greater than 30% in the respective industries (Reichelt & Wang, 2009). We calculate an auditor's market share in a given industry as follows:

$$\text{ADTR\_MS}_{ik} = \frac{\sum_{j=1}^{J_{ik}} \text{AF}_{ijk}}{\sum_{i=1}^{I_k} \sum_{j=1}^{J_{ik}} \text{AF}_{ijk}} \tag{3}$$

AF denotes audit fees received by the audit firms. The numerator is the sum of the audit fees of all J_{ik} clients of audit firm i in industry k. The denominator is the audit fees of all J_{ik} clients in industry k, summed over all I_k audit firms.

Variable definition: ARL: is audit report lag measured as the difference between the annual repot publication date and the recent fiscal year end date; FYE: a dummy variable coded 1 if the company has a year-end that falls between March 31 and June 30, inclusive and 0 otherwise; INDUM: We use a dummy variable equal to 1 for companies belonging to the finance and investment sectors to proxy for industry classification, and zero otherwise; SIZE: company size and is measured as the natural log of total assets; LOSS: Companies reporting a loss for the years examined were coded as 1, and zero otherwise; NAF: non-audit service fees measured as the total amount of fees paid to the company's principal auditor that is not for the audit work; SUB: number of principal subsidiaries; FINCOND: the company's probability of bankruptcy, estimated from Zmijewski's (1984) bankruptcy prediction model as follows, to proxy for financial condition.

$$\text{ZFC} = -4.336 - 4.513(\text{ROA}) + 5.679(\text{FINL}) + 0.004(\text{LIQ}) \tag{4}$$

where ZFC is an estimate of Zmijewski's financial condition index; ROA is the return on assets (the ratio of net income to total assets); FINL is the financial leverage (the ratio of total debt to total assets), and LIQ is the liquidity (the ratio of current assets to current liabilities); STEN: short tenure measured by a dummy variable 1 if auditor tenure is less than or equal to three years, zero otherwise; LTEN: long tenure measured by a dummy variable 1 if auditor tenure is more than or equal to nine years, zero otherwise; OWNCON: ownership concentration proxied by top 5 shareholdings. IFRS: a dummy variable taking the value of 1 for firm-year observations from the post IFRS period (after January 2007) and zero otherwise. *, **, *** represent statistical significance at the 1%, 5% and 10% levels respectively (one-tailed test).

Table 2
Univariate analysis of the difference in the ARL between industry specialist and non-specialist auditors.

Variables	Definition 1			Definition 2		
	Specialists	Non-specialists	Test of difference	Specialists	Non-specialists	Test of difference
ARL	55	65	−6.24*	55	64	−5.24*
INDUM	0.13	0.21	−2.41**	0.14	0.20	−1.64***
SIZE	5.39	4.73	8.13*	5.45	4.73	8.79*
LOSS	0.13	0.27	−3.92*	0.13	0.26	−3.39*
FINCOND	−2.69	−1.99	0.89	−2.68	−2.03	0.81
SUB	7.96	5.96	2.53**	8.41	5.80	3.26*
NAF	129,649	31,005	6.59*	137,617	31,476	7.00*
STEN	0.26	0.31	1.08	0.22	0.33	−2.42**
LTEN	0.33	0.41	−1.86**	0.35	0.39	−0.91
OWNCON	0.54	0.51	1.07	0.52	0.52	0.22

Note: Variables are defined in Table 1. *, **, *** represent statistical significance at the 1%, 5% and 10% levels respectively (one-tailed test).

1% level. Firms audited by industry specialists are larger, more profitable, purchase more NAS, have more subsidiaries and are audited by audit firms with shorter audit tenure compared with their non-specialist counterparts.

4.3. Multivariate analysis of the association between audit firm industry specialization and the ARL

Although univariate analysis provides findings consistent with the hypothesis, such analysis does not control for other known determinants of the ARL. Therefore we provide multivariate regression analysis results in Table 3. Two specifications and three models under each specification are presented. Columns (2)–(7) present results based on definition 1 of national industry specialist auditors (SPEC). Columns (8–13) provide regression results when the 'industry specialization' definition is based on the auditors' market share (Definition 2 or SPEC30). With respect to the primary findings, results reveal that firms that are audited by specialist auditors enjoy a shorter ARL to the extent of almost five days. H_1, therefore, is supported. The coefficient on industry specialization is significant at better than the 1% level. Model 3 examines whether the mandatory adoption of the IFRS has any effect on the ARL and finds evidence consistent with Walker and Hay (2007) that the ARL increases significantly in New Zealand after the adoption of the IFRSs (coefficient 7.18, *t*-statistic 3.18, significant at better than the 1% level).

Table 3
Multivariate analysis of the determinants of the ARL.

Variables	SPEC						SPEC30					
	Model 1		Model 2		Model 3		Model 1		Model 2		Model 3	
	Coefficient	*t*-Stat	Coefficient	*t*-Stat	Coefficient	*t*-Stat	Coefficient	*t*-Stat	Coefficient	*t*-Stat	Coefficient	*t*-Stat
Intercept	70.76*	10.54	68.64*	10.03	68.59*	10.26	70.76*	10.54	68.62*	10.07	68.82*	10.36
FYE	−1.07	−0.55	−1.33	−0.69	−1.18	−0.61	−1.07	−0.55	−1.14	−0.60	−0.99	−0.52
INDUM	3.71**	1.66	3.77**	1.70	3.62**	1.64	3.71**	1.66	3.63**	1.64	3.53***	1.59
SIZE	−4.57*	−3.87	−3.68*	−2.89	−3.70*	−2.90	−4.57*	−3.87	−3.72*	−2.99	−3.74*	−3.01
LOSS	13.63*	4.45	14.08*	4.57	14.11*	4.54	13.63*	4.45	13.78*	4.53	13.78*	4.49
FINCOND	−0.01	−0.06	0.00	0.05	0.00	0.01	−0.01	−0.06	0.00	0.03	0.00	−0.01
SUB	0.31*	3.11	0.29*	2.88	0.31*	3.11	0.31*	3.11	0.28*	2.78	0.30*	3.02
NAF	0.00	−0.74	0.00	−0.04	0.00	−0.26	0.00	−0.74	0.00	0.08	0.00	−0.15
STEN	6.87*	3.32	6.34*	3.09	6.17*	3.03	6.87*	3.32	6.61*	3.24	6.27*	3.09
LTEN	0.62	0.38	0.10	0.06	0.41	0.26	0.62	0.38	0.00	0.00	0.21	0.13
OWNCON	5.47**	1.69	5.20***	1.60	5.17***	1.60	5.47**	1.69	5.88**	1.82	5.81**	1.81
SPEC	–	–	−4.74*	−3.09	−2.39	−1.29	–	–	−5.28*	−3.51	−3.09***	−1.67
IFRS	–	–	–	–	7.18*	3.18	–	–	–	–	7.28*	3.10
SPEC × IFRS	–	–	–	–	−5.58**	−2.06	–	–	–	–	−5.09***	−1.84
Adjusted R^2	0.25		0.26		0.27		0.25		0.27		0.27	
f-Stat	13.12*		13.13*		14.95*		13.12*		13.13*		15.14	
Observations	502		502		502		502		502		502	502
Year dummies	*		*		*		*		*		*	

Note: Variables are defined in Table 1. *, **, *** represent statistical significance at the 1%, 5% and 10% levels respectively (one-tailed test). White's heteroscedasticity-corrected *t* statistics are presented which assumes that the residuals of the estimated equation are serially uncorrelated. However, where both heteroscedasticity and autocorrelation of unknown form has been encountered, Newey and West (1987) standard errors have been used.

$$\mathrm{ARL} = \eta_0 + \eta_1 \mathrm{FYE} + \eta_2 \mathrm{INDUM} + \eta_3 \mathrm{SIZE} + \eta_4 \mathrm{LOSS} + \eta_5 \mathrm{FINCOND} + \eta_6 \mathrm{SUB} + \eta_7 \mathrm{NAF} + \eta_8 \mathrm{STEN} + \eta_9 \mathrm{LTEN} + \eta_{10} \mathrm{OWNCON} + \eta_{11} \mathrm{SPEC} + \varepsilon \quad (1)$$

$$\mathrm{ARL} = \eta_0 + \eta_1 \mathrm{FYE} + \eta_2 \mathrm{INDUM} + \eta_3 \mathrm{SIZE} + \eta_4 \mathrm{LOSS} + \eta_5 \mathrm{FINCOND} + \eta_6 \mathrm{SUB} + \eta_7 \mathrm{NAF} + \eta_8 \mathrm{STEN} + \eta_9 \mathrm{LTEN} + \eta_{10} \mathrm{OWNCON} + \eta_{11} \mathrm{SPEC} + \eta_{12} \mathrm{IFRS} + \eta_{13} \mathrm{SPEC} \times \mathrm{IFRS} + \varepsilon \quad (2)$$

Marden and Brackney (2009) emphasize that the adoption of IFRS will increase audit risks, because auditors now have to verify increased managerial judgments because of the principles-based standard-setting approach pursued by the International Accounting Standards Board (IASB). This increased risk will require more audit effort and time and hence a longer audit delay. This is evident from the positive and significant coefficient on IFRS. Since SPEC is a dummy variable taking the value of 1 for industry specialists, and 0 for non-specialists, this coefficient represents average increase in ARL for non-specialists because of adoption of the IFRS. Interestingly, the interactive coefficient SPEC × IFRS enters the regression equation with a negative sign and the coefficient is statistically significant at better than the 10% level. The sum of the coefficients on IFRS and SPEC × IFRS is statistically indistinguishable from zero (*f*-statistic 1.05). This implies that although the ARL has increased after the adoption of IFRS, firms audited by industry specialist auditors have not been affected. A similar result is found with respect to the IFRS adoption on ARL when SPEC30 is used as the industry specialization proxy. The coefficient on SPEC30 is negative and statistically significant; that of IFRS is positive and significant; and the interactive coefficient on SPEC30 × IFRS is negative and statistically significant at better than the 10% level. The joint coefficient on IFRS and SPEC30 × IFRS is not statistically significant (*f*-statistic, 2.10, *p*-value 0.15) consistent with the earlier finding.

With respect to the control variables, results reveal that the ARL is shorter for larger firms, and that finding is consistent with a number of prior studies documenting shorter ARLs for larger firms (Ashton & Newton, 1989; Carslaw & Kaplan, 1991; Ng & Tai, 1994; among others), but inconsistent with Ashton et al. (1987) who report a positive coefficient on firm size for the overall sample. The ARL is found to be much higher (close to 14 days) for loss making firms, confirming the view that managers of such firms tend to withhold bad news for a longer period of time. Carslaw and Kaplan (1991, p. 24) reason that: "A company with a loss may request the auditor to schedule the start of the audit later than usual. Second, an auditor may proceed more cautiously during the audit process in response to a company loss if the auditor believes the company's failure increases the likelihood of financial failure or management fraud".

The ARL is found to be longer for firms with a large number of subsidiaries, which is again consistent with earlier studies, and reflects the complexity of auditing such firms. Lee et al. (2009) find that audit tenure has a significant impact on the ARL, in that lengthy audit tenure is associated with a decrease in the ARL by an average of 2.3 days. This study finds that the coefficient on STEN is positive and statistically significant at better than the 1% level in all the specifications and, on average, increases the ARL by 6.5 days. Current literature on the effect of audit tenure on financial reporting quality seems to indicate that firms audited by long-tenured auditors provide high quality financial statements compared with their short-tenured counterparts (Gul, Jaggi & Krishnan, 2007; Myers, Myers, & Omer, 2003). Whether this increased ARL for clients audited by short-tenured auditors result in low quality financial reporting can be a topic of future research. The coefficient on ownership concentration (OWNCON) is found to be positive and statistically significant at better than 10% level in all the specifications.

4.4. Self-selection problem

The ordinary least squares (OLS) regression estimates of the determinants of ARL as a function of industry specialist auditor and other controls works well, as long as the choice of industry specialist auditors remains random. However, firms choose industry specialist auditors as a response to certain firm-specific characteristics. From the ARL perspective, the self-selection problem arises because ARLs are observable only after a firm has chosen an auditor, while the ARL under an alternative auditor choice remain unobserved. This makes the choice of industry specialist auditor an endogenous variable. To address the self-selection problem, we perform the following regression equation which includes all the variables form regression Eq. (2) except the SPEC variable for the specialist and non-specialist groups separately in Table 4.

$$\begin{aligned}\mathrm{ARL} = {} & \eta_0 + \eta_1 \mathrm{FYE} + \eta_2 \mathrm{INDUM} + \eta_3 \mathrm{SIZE} + \eta_4 \mathrm{LOSS} + \eta_5 \mathrm{FINCOND} + \eta_6 \mathrm{SUB} + \eta_7 \mathrm{NAF} + \eta_8 \mathrm{STEN} + \eta_9 \mathrm{LTEN} \\ & + \eta_{10} \mathrm{OWNCON} + \eta_{11} \mathrm{IFRS} + \varepsilon \end{aligned} \tag{5}$$

and find that the regression model has much better explanatory power for the specialist than the non-specialist group (adjusted R^2 of 0.41 and 0.25 respectively). Also, most of the explanatory variables have the expected sign and significance for the specialist group regression. For example, the coefficient on IFRS is positive and statistically significant at the 1% level for the non-specialist group but not for the specialist group which is consistent with the findings from Table 3.

4.5. Sensitivity tests

This section reports the results of a number of sensitivity tests used to substantiate the main findings.

4.5.1. Alternative definition of ARL

A sensitivity analysis is performed using abnormal audit report lag as the dependent measure. Following Bamber et al. (1993), client year-specific abnormal ARL is defined as the client's current ARL minus the client's median ARL where the median is calculated over the sample period. Abnormal ARL is then regressed on the firm-specific factors in Eq. (2). Untabulated result shows that the coefficient on SPEC and SPEC × IFRS are both negative and statistically significant at better than the 10% level, implying that the abnormal audit delay for the specialist auditors is lower than for their non-specialist counterparts.

Table 4
Self-selection and the effect of industry specialist auditors on the ARL.

Variables	Specialists		Non-specialists	
	Coefficient	*t*-Stat	Coefficient	*t*-Stat
Intercept	79.59*	13.56	59.26*	5.67
FYE	−0.70	−0.36	−3.04	−1.05
INDUM	1.58	0.52	6.20**	2.20
SIZE	−5.13*	−4.39	−2.03	−1.02
LOSS	6.47***	1.71	15.24*	3.69
FINCOND	1.54*	3.30	−0.02	−0.30
SUB	0.30*	2.99	0.17	1.16
NAF	0.00	−1.32	0.00	1.19
STEN	−1.20	−0.63	10.39*	3.60
LTEN	0.45	0.27	0.41	0.16
OWNCON	9.17*	2.64	5.97	1.28
IFRS	0.21	0.15	7.78*	3.43
Adjusted R^2	0.41		0.25	
f-Stat	12.19*		9.41*	
Observations	179		323	
Year dummies	*		*	

Note: variable definitions are provided in Table 1. *, **, *** represent statistical significant at the 1%, 5% and 10% levels respectively (one-tailed test). White's heteroscedasticity-corrected t statistics are presented which assumes that the residuals of the estimated equation are serially uncorrelated. However, where both heteroscedasticity and autocorrelation of unknown form has been encountered, Newey and West (1987) standard errors have been used.

$$\text{ARL} = \eta_0 + \eta_1 \text{FYE} + \eta_2 \text{INDUM} + \eta_3 \text{SIZE} + \eta_4 \text{LOSS} + \eta_5 \text{FINCOND} + \eta_6 \text{SUB} + \eta_7 \text{NAF} + \eta_8 \text{STEN} + \eta_9 \text{LTEN} + \eta_{10} \text{OWNCON} + \eta_{11} \text{IFRS} + \varepsilon \quad (5)$$

4.5.2. Alternative auditor industry specialization measure

An alternative industry-specialization measure based on clients' sales revenues is used to rule out the possibility that differences in the measurement of industry specialization might result in different conclusions. The following formula measures this alternative specialization construct:

$$\text{ADTR\_MS}_{ik} = \frac{\sum_{j=1}^{J_{ik}} \text{SALES}_{ijk}}{\sum_{i=1}^{I_k} \sum_{j=1}^{J_{ik}} \text{SALES}_{ijk}} \quad (6)$$

where SALES is sales revenue, and the numerator is the sum of the sales of all J_{ik} clients of the audit firm i in industry k. The denominator is the sales of all J_{ik} clients in industry k, summed over all I_k audit firms. There is a strong positive correlation between audit fee-based and sales revenue-based industry specialization measures (the pair-wise correlation between the two definitions of industry specialization measures is 0.77 and 0.83 respectively). It is, therefore, not surprising to find that the coefficients on SPEC in Eqs. (1) and (2) are negative and statistically significant at better than the 1% level when the sales-based measure is replaced by the audit fee-based specialization measure (result not reported).

4.5.3. City-level industry specialization and the ARL

As argued previously, New Zealand is characterized by a low degree of geographical dispersion, which may enable the audit firms to enjoy relatively easy transferability of national-level expertise to the city level. However, in the absence of any empirical evidence to support such a proposition, we provide a sensitivity test of the effect of city as well as both city and national level industry specialization on the ARL using Eq. (1) in Table 5.[7] The pair-wise correlation between national and city level SPEC (SPEC30) measures is 0.62 (0.57) respectively. Table 5 shows that the coefficients on city-specialist variables are reliably negative and significant implying that city-level specialization also matters. The coefficient on both the national and city-specialist variable is also negative, albeit at a higher significance level.

4.5.4. Industry differences

Although the basic regression Eqs. (1) and (2) control for the industry effect by including a dummy variable for Finance and Investment industries, this does not entirely capture the significant variation that exists among industries with respect to regulation. A commonly used industry categorization regarding the effect of industry specialization on some outcomes (e.g., client disclosure quality; audit market concentration) is whether the industries are regulated or not. Industry regulation demands highly standardized reporting, which industry specialist auditors may be able to perform in a shorter period compared with their non-regulated industry counterparts. On the other hand, industry specialist auditors may add more value for firms operating in the unregulated industries because of significant cross-sectional variation in the reporting environment where industry-focused knowledge may result in audit efficiency. In the absence of a rigorous theory explaining

[7] Results using Eq. (2) are virtually identical.

Table 5
Effect of city and joint city and national specialist auditors on the ARL.

Specialist definition	(1)	(2)	(3)
National specialist			
Definition 1 (SPEC)	−4.74*	–	–
	(−3.09)		–
Definition 2 (SPEC30)	−5.28*	–	–
	(−3.51)	–	–
City specialist			
Definition 1 (SPEC)	–	−8.36*	–
	–	(−5.27)	–
Definition 2 (SPEC30)	–	−7.96*	–
	–	(−3.16)	–
National and city specialist			
Definition 1 (SPEC)	–	–	−5.06**
	–	–	(−2.00)
Definition 2 (SPEC30)	–	–	−5.54**
	–	–	(−2.24)

Note: Definition 1 defines a national (city) industry specialist if in a particular year (and in a particular city) the auditor has the largest market share in respective industries and if its market share is at least ten percentage points greater than the second largest industry leader in a national (city) audit market. Definition 2 defines a national (city) industry specialist if in a particular year (and in a particular city) the auditor has a market share greater than 30% in the respective industries. The coefficient values of the control variables are not reported for the sake of brevity. *, ** represent statistical significance at the 1%, and 5% levels respectively (one-tailed test).

$$\text{ARL} = \eta_0 + \eta_1 \text{FYE} + \eta_2 \text{INDUM} + \eta_3 \text{SIZE} + \eta_4 \text{LOSS} + \eta_5 \text{FINCOND} + \eta_6 \text{SUB} + \eta_7 \text{NAF} + \eta_8 \text{STEN} + \eta_9 \text{LTEN} + \eta_{10} \text{OWNCON} + \eta_{11} \text{SPEC} + \varepsilon \quad (1)$$

the effect of industry regulation on ARL, we do not make any directional hypothesis, but rather provide an exploratory result only.

This study defines Finance, Investment, Mining, Food, Media and Communications and Air aviation as the regulated industries, following the definition adopted by Hogan and Jeter (1999) and Dunn and Mayhew (2004). Commerce Commission in NZ lists electricity, gas pipelines, airports and telecommunications as the regulated industries in NZ. Unreported regression results reveal that the coefficients associated with industry specialization measures are more negative for regulated industries than their non-regulated counterparts. The coefficients on SPEC are −10.76 and −4.76 for the regulated versus unregulated industries respectively which are statistically significant at better than the 1% level. This confirms the conjecture that highly standardized reporting in regulated industries allows specialist auditors to do the audit sooner than the non-specialist auditors.

5. Conclusions

Audit report lag is one of the very few observable outputs available to outside stakeholders to evaluate audit efficiency. A sizable body of empirical research has found that ARL is determined by certain firm and audit-specific characteristics. This paper expands this stream of research by incorporating audit firm industry specialization as an important explanatory variable for ARL. Audit firms have restructured themselves along industry lines to better serve their clientele base, because such specialization reduces audit production costs. Although industry specialization has been researched from the information quality perspective, to the best of our knowledge, this is the first study to document an association between industry specialization and the ARL. This study finds evidence consistent with the proposition that industry specialist auditors are capable of performing their audits sooner compared with their non-specialist counterparts as reflected in a shorter ARL, because of their significant industry-specific knowledge. This paper also reveals that although the adoption of IFRS in New Zealand has increased ARLs, that effect is mostly confined to non-specialist auditors. Since the sample contains only one year of post IFRS adoption data, this result should be interpreted cautiously. It may be that specialist auditors are better able to deal with the changes introduced by IFRSs in the first year after IFRS adoption, but with time non-specialist auditors too are likely to catch up with the specialists.[8]

The results reported in this study in New Zealand context is expected to be generalizable to other developed country setting. New Zealand belongs to a common law reporting environment as do Australia, USA, and UK and share many similarities regarding accounting and auditing practices. Like the USA, audit firms in New Zealand, too, are competing on the basis of industry specialization to differentiate themselves from the non-specialists which is evident from claims like, "The depth of our industry expertise, like our international perspective, is an attribute that our clients value highly" (http://www.pwc.com/nz/en/industries/index.jhtml). Developing industry specialization is costly since it requires significant investment of resources. From a cost-benefit perspective, such an investment (cost) is justified because audit firms making those investments are expected to provide high quality audits (providing audit report sooner could be interpreted

[8] We thank an anonymous reviewer for this insight.

as one such dimension of audit quality). So the negative association between industry specialization and ARL documented in this study is also likely to hold in other contexts too.

The findings from the study suffer from some limitations. Firstly, like any other empirical accounting research, correlated omitted variables could explain the shorter ARLs for the industry specialist auditors. While the control variables included in the primary regression model is all grounded on established theories and validated by prior research, there may still be some variables which are excluded from the regression model, yet is important for explaining the ARL. Secondly, this study does not directly address how differences in auditor efficiency could impact the ARL. Moroney (2007) conducts an experiment between superannuation and manufacturing fund specialists to determine the relative efficiency of the industry specialist auditors. Superannuation specialists were found to be more efficient, because auditors encounter many of the same issues when moving from one client to another in that highly regulated industry. However, this was not the case for manufacturing specialists, who experience significant operational variation between clients within the same industry.

References

Afify, H. A. E. (2009). Determinants of audit report lag: Does implementation of corporate governance have any impact? *Applied Accounting Research*, *10*(1), 56–86.

Ashton, R. H., Graul, P. R., & Newton, J. D. (1989). Audit delay and the timeliness of corporate reporting. *Contemporary Accounting Research*, *5*(2), 657–673.

Ashton, R. H., & Newton, J. D. (1989). The association between audit technology and audit delay. *Auditing: A Journal of Practice and Theory*, *8*, 22–37.

Ashton, R. H., Willingham, J. J., & Elliot, R. K. (1987). An empirical analysis of audit delay. *Journal of Accounting Research*, *25*, 275–292.

Balsam, S., Krishnan, J., & Yang, J. S. (2003). Auditor industry specialization and earnings quality. *Auditing: A Journal of Practice & Theory*, *22*, 71–97.

Bamber, E. M., Bamber, L. S., & Schoderbek, M. P. (1993). Audit structure and other determinants of ARL: An empirical analysis. *Auditing: A Journal of Practice & Theory*, *12*(Spring), 1–23.

Basioudis, I. G., & Francis, J. R. (2007). Big 4 audit fee premiums for national and office-level industry leadership in the United Kingdom. *Auditing: A Journal of Practice & Theory*, *26*(2), 143–166.

Behn, B. K., Choi, J-H., & Kang, T. (2008). Audit quality and properties of analysts' earnings forecasts. *The Accounting Review*, *83*(2), 327–349.

Carslaw, C., & Kaplan, S. E. (1991). An examination of audit delay: Further evidence from New Zealand. *Accounting and Business Research*, *22*, 21–32.

Choi, S. K., & Jeter, D. C. (1992). The effects of qualified audit opinions on earnings response coefficients. *Journal of Accounting and Economics*, *15*, 229–247.

Commerce Commission. http://www.comcom.govt.nz/regulated-industries.

Courtis, J. K. (1976). Relationships between timeliness in corporate reporting and corporate attributes. *Accounting and Business Research*, *25*, 45–56.

Davis, B., & Whittred, G. P. (1980). The association between selected corporate attributes and timeliness in corporate reporting: Further analysis. *Abacus*, *16*(1), 48–60.

Dodd, P., Dopuch, N., Holthausen, R., & Leftwich, R. (1984). Qualified audit opinions and stock prices: Information content, announcement dates, and concurrent disclosures. *Journal of Accounting and Economics*, *6*, 3–38.

Dopuch, N., Holthausen, R., & Leftwich, R. (1986). Abnormal stock returns associated with media disclosures of 'subject to' qualified audit opinions. *Journal of Accounting and Economics*, *8*, 93–117.

Dowling, C., & Moroney, R. (2008). Auditor performance variation: Impact of sub-specialty knowledge differences between industry specialists. *Advances in Accounting Behavioral Research*, *19*, 59–80.

Dunn, K. A., & Mayhew, B. W. (2004). Audit firm industry specialization and client disclosure quality. *Review of Accounting Studies*, *9*, 35–58.

Dyer, J. C., & McHugh, A. J. (1975). The timeliness of the Australian annual report. *Journal of Accounting Research*, *13*(2), 204–219.

Ferguson, A., Francis, J. R., & Stokes, D. J. (2003). The effects of firm-wide and office-level industry expertise on audit pricing. *The Accounting Review*, *78*(2), 429–448.

Ferguson, M. J., Seow, G. S., & Young, D. (2004). Nonaudit services and earnings management: UK evidence. *Contemporary Accounting Research*, *21*(4), 813–841.

Frankel, R. M., Johnson, M. F., & Nelson, K. K. (2002). The relation between auditors' fees for nonaudit services and earnings management. *The Accounting Review*, *77*(Supplement), 71–105.

Gilling, D. M. (1977). Timeliness in corporate reporting: Some further comment. *Accounting and Business Research*, *2*, 34–36.

Gujarati, D. (1995). *Basic econometrics*. McGraw-Hill, Inc.

Gul, F. A., Fung, S. Y. T., & Jaggi, B. (2009). Earnings quality: Some evidence on the role of auditor tenure and auditors' industry expertise. *Journal of Accounting and Economics*, *47*, 265–287.

Gul, F. A., Jaggi, B. L., & Krishnan, G. V. (2007). Auditor independence: Evidence on the joint effects of auditor tenure and nonaudit fees. *Auditing: A Journal of Practice & Theory*, *26*(2), 117–142.

Hammersley, J. S. (2006). Pattern identification and industry-specialist auditors. *The Accounting Review*, *81*(2), 309–336.

Hogan, C. E., & Jeter, D. C. (1999). Industry specialization by auditors. *Auditing: A Journal of Practice and Theory*, *18*, 1–17.

Jaggi, B., & Tsui, J. (1999). Determinants of ARL: Further evidence from Hong Kong. *Accounting and Business Research*, *30*, 17–28.

Krishnan, G. V. (2003). Does Big 6 auditor industry expertise constrain earnings management? *Accounting Horizons*, *17*(Supplement), 1–16.

Krishnan, G. V. (2005). The association between Big 6 auditor industry expertise and the asymmetric timeliness of earnings. *Journal of Accounting, Auditing & Finance*, *20*(3), 209–228.

Knechel, W., & Pyne, J. (2001). Additional evidence on audit report lag. *Auditing: A Journal of Practice & Theory*, *20*, 137–146.

Kwon, S. Y., Lim, C. Y., & Tan, P. M-S. (2007). Legal systems and earnings quality: The role of auditor industry specialization. *Auditing: A Journal of Practice & Theory*, *26*(2), 25–56.

Lee, H.-Y., Mande, V., & Son, M. (2009). Do lengthy auditor tenure and the provision of non audit services by the external auditor reduce audit report lags? *International Journal of Auditing*, *13*, 87–104.

Leventis, S., Weetman, P., & Constantinos, C. (2005). Determinants of audit report lag: Some evidence from the Athens Stock Exchange. *International Journal of Auditing*, *9*, 45–58.

Maletta, M., & Wright, A. (1996). Audit evidence planning: An examination of industry error characteristics. *Auditing: A Journal of Practice & Theory*, *15*(Spring), 71–86.

Marden, R. E., & Brackney, K. S. (2009). Does increased flexibility increase audit risk? *The CPA Journal*, *79*(6), 32–36.

Mayhew, B. W., & Wilkins, M. S. (2003). Audit firm industry specialization as a differentiation strategy: Evidence from fees charged to firms going public. *Auditing: A Journal of Practice & Theory*, *22*, 33–52.

Moroney, R. (2007). Does industry expertise improve the efficiency of audit judgment? *Auditing: A Journal of Practice and Theory*, *26*(2), 69–95.

Myers, J. N., Myers, L. A., & Omer, T. C. (2003). Exploring the term of the auditor–client relationship and the quality of earnings: A case for mandatory auditor rotation? *The Accounting Review*, *78*(3), 779–799.

Newey, W., & West, K. (1987). A simple positive semi-definite, heteroscedascity and autocorrelation consistent covariance matrix. *Econometrica*, *55*, 703–708.

Ng, P. H., & Tai, Y. K. (1994). An empirical examination of the determinants of audit delay in Hong Kong. *British Accounting Review*, *26*, 43–59.

Owhoso, V. E., Messier, W. F., & Lynch, J. G. (2002). Error detection by industry-specialized teams during sequential audit review. *Journal of Accounting Research*, *40*(3), 883–900.
Payne, J. L. (2008). The influence of audit firm specialization on analysts' forecast errors. *Auditing: A Journal of Practice & Theory*, *27*(2), 109–136.
Reichelt, K. J., & Wang, D. (2009). National and office-specific measures of auditor industry expertise and effects on audit quality. *Journal of Accounting Research*, *48*(3), 647–686.
Romanus, R. N., Maher, J. J., & Fleming, D. M. (2008). Auditor industry specialization, auditor changes, and accounting restatements. *Accounting Horizons*, *22*(4), 389–413.
Schwartz, K. B., & Soo, B. S. (1996). The association between auditor changes and reporting lags. *Contemporary Accounting Research*, *13*, 353–370.
Solomon, I., Shields, M. D., & Whittington, O. R. (1999). What do industry-specialist auditors know? *Journal of Accounting Research*, *37*(1), 191–208.
Soltani, B. (2002). Timeliness of corporate and audit reports: Some empirical evidence in the French context. *The International Journal of Accounting*, *37*, 215–246.
Taylor, M. H. (2000). The effects of industry specialization on auditors' inherent risk assessments and confidence judgments. *Contemporary Accounting Research*, *17*, 693–712.
Velury, U. (2003). The association between auditor industry specialization and earnings management. *Research in Accounting Regulation*, *16*, 171–184.
Walker, A., & Hay, D. (2007). *An empirical investigation of audit report lag: the effect of non-audit services*. Working paper, University of Auckland.
Watts, R. L., & Zimmerman, J. L. (1983). Agency problems, auditing, and the theory of the firm: some evidence. *Journal of Law & Economics*, *26*(3), 613–633.
Watts, R., & Zimmerman, J. L. (1986). *Positive accounting theory*. New Jersey: Prentice-Hall Contemporary topics in Accounting series.
Whittred, G. P., & Zimmer, I. (1980). Audit qualification and the timeliness of corporate annual reports. *The Accounting Review*, *50*(4), 563–577.
Whittred, G. P., & Zimmer, I. (1984). Timeliness of financial reporting and financial distress. *The Accounting Review*, *59*(2), 287–295.
Zmijewski, M. E. (1984). Methodological issues related to the estimation of financial distress prediction models. *Journal of Accounting Research*, *22*(Supplement), 59–82.