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The impact of auditor education level on the relationship between auditor busyness and audit quality in Turkey

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Abstract: In this study, I examine the effect of auditor education level on the relationship between auditor busyness and audit quality using Turkish listed firms. Prior studies regarding auditor busyness have not considered how auditor busyness affects audit quality in the case of auditors who are less educated or more educated. I created some interaction variables using busyness and auditor education level. Additionally, the sample was split into two groups based on auditor education level. The main estimation results show that auditor busyness (auditor education level) negatively (positively) affects audit quality. Auditor formal education level minimises the negative effect of auditor busyness on auditor quality. Also, I found that the negative effect of auditor busyness on audit quality is more pronounced in the case of less educated auditors.

Subjects: Business; Management and Accounting; Accounting Education; Auditing

Keywords: Auditor busyness; auditor education; audit quality; modified audit opinion; audit report aggressiveness; Turkey

JEL classification: M40; M41; M42; M43

1. Introduction

Auditor busyness¹ is seen as a factor affecting audit quality (AQ) negatively. Busyness at auditor level is computed using the total number of clients of the auditor (audit partner²) in recent studies. Some researchers (Goodwin & Wu, 2016; Gul, Ma, & Lai, 2017; Lai, Sasmita, Gul, Foo, & Hutchinson, 2016; Sundgren & Svanström, 2014; Suzuki & Takada, 2016) concentrate on the impact of the

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PUBLIC INTEREST STATEMENT

In Turkey, as in many countries, regulations do not limit how many clients an auditor should have. However, a high number of clients audited by an auditor is viewed as the critical factor in determining and conducting audit quality. As well, educational background of auditors is seen as one of the significant factors enhancing audit quality. This article has tested the effect of busy but highly educated auditors on audit quality. It was found that highly educated auditors reduce the negative effect of workload on audit quality because of features that they have. Based on the results, the number of clients of auditors may be limited by regulations to increase audit quality or more clients could be assigned to highly educated auditors.

auditor's number of clients on the AQ, while others (Balsam, Krishnan, & Yang, 2003; Che, Langli, & Svanström, 2017; Hardies, Breesch, & Branson, 2016; Karjalainen, 2011; Karjalainen, Niskanen, & Niskanen, 2013) included the variable -auditor busyness- as a control variable in their studies regarding AQ. All of these recent studies concentrate on the auditor busyness effect on audit quality which is discussed as discretionary accruals, audit opinion, and small profits in some developed and developing countries. The main arguments concerning the effect of auditor busyness on AQ is that it negatively affects AQ. This is because busy auditors do not have enough time to understand clients' business and financial statements and they do not have enough time to collect information about clients (Gul et al., 2017; Sundgren & Svanström, 2014) or, they may not detect earnings management practices because of a lack of focus caused by having a large client portfolio (Lai et al., 2016; Suzuki & Takada, 2016). Auditor education level is one of the major attributes that enhances AQ (Yan & Xie, 2016). Auditors with post-graduate degree provide more qualified audit work than auditors with bachelor's degree because of having more knowledge (Cahan & Sun, 2015; Che et al., 2017), being more capable & competent and exerting more effort (Bröcheler, Majoor, & van Witteloosetuijn, 2004; Che et al., 2017; Ye, Cheng, & Gao, 2014). These qualifications of educated auditors make them more conservative when they perform audit tasks and can help educated auditors use their time more efficiently and help them overcome the problems that can result from lack of time. As stated in Che et al. (2017) and Lai et al. (2016)'s studies, highly educated auditors exert more effort, greater audit effort is likely to improve audit quality and educated but busy auditors exerting great effort might minimise the negative effect of auditor busyness on audit quality. On the other hand, workload as a stressor (Nor, 2011; Smith, Derrick, & Koval, 2010) inversely affects audit quality, educated people are more likely to ease the negative effect of stress (EğİN, 2015) because of having more resources to cope with stressful situations (Michael, Anastasios, Helen, Catherine, & Christine, 2009) and more control over the work process (Ross & Reskin, 1992). Thus, auditor education level may minimise the negative effect of busyness on audit quality.

In this study, I follow Gul et al. (2017), Sundgren and Svanström (2014), Lai et al. (2016) and Suzuki and Takada (2016)'s studies and investigate the effect of auditor busyness on AQ using Turkish listed firms between 2010 and 2016. Prior research regarding auditor busyness has not considered how auditor formal education level minimises the negative effect of auditor busyness on auditor quality and how auditor busyness affects AQ in the case of auditors who are less educated or more educated. AQ is measured by audit opinion (modified) as discussed in recent studies regarding auditor busyness. Unlike other studies, audit report aggressiveness is used as a measure of AQ in this study. Additionally, I present some findings regarding the importance of auditor education on the relationship between auditor busyness and AQ. This study contributes to the audit literature in several ways. First, it contributes in terms of discussing the importance of auditor education on the relationship between auditor busyness and AQ. This situation was not discussed in the literature regarding auditor busyness before. Second, it contributes in terms of discussing the effect of auditor busyness on AQ using Turkish firms. The Turkish audit market is a developing market and findings obtained from this market may shed light on emerging markets. The sample consists of 1,342 firm*years observations. Ordinary least square (OLS) and logistic regression were mainly used to test the hypothesis. In addition, for sensitivity purposes the sample was split into two groups based on auditor education level to examine how busyness affects AQ for more educated auditors and less educated auditors.

Estimation results show that auditor formal education level minimises the negative effect of auditor busyness on auditor quality. Busy auditors (auditors with post-graduate education) provide low (high) AQ when it is proxied by modified audit opinion and audit report aggressiveness. Additional analyses suggest that the negative influence of busyness on AQ is more pronounced among less educated auditors.

This study has some limitations. First, I used a small sample to test the impact of auditor busyness on AQ compared to the samples of Gul et al. (2017), Goodwin and Wu (2016), Lai et al.

(2016), Sundgren and Svanström (2014), and Suzuki and Takada (2016). Second, discretionary accruals or real activities manipulation are not employed as a measure of AQ. Third, I ignored the effect of some auditor-specific characteristics such as experience, gender and certification.

The current study proceeds as follows. First, brief information about the audit environment in Turkey is presented. Second, I review the relevant literature and develop my hypothesis. Then, the sample is presented and finally I report my findings and conclude the paper.

2. Audit environment in Turkey

The Turkish audit market is a developing market, and regulations regarding the audit market in Turkey generally follow international trends such as the regulations of the International Auditing and Assurance Standards Board. Capital Market Boards of Turkey, Banking Regulation and Supervision Agency of Turkey, Turkish Public Oversight Board, Energy Regulatory Authority of Turkey, and the Union of Chambers of Certified Public Accountants of Turkey (TÜRMOB), which are the main regulatory boards regarding audits. The regulations (Capital Market Law of Turkey (2012) and laws about Certified General Accountancy, Certified Public Accountancy, and Sworn-in Public Accountancy (SMMM&YMM) (1989), and Turkish Commerce Law (2011) etc.) are directed by international regulations.

In Turkey, the names of audit firms and auditors are disclosed in the audit reports. Audit reports can only be signed by one audit firm and one auditor. These auditors should have a CPA license issued by TÜRMOB. In addition, auditors should have an independent audit license issued by the Turkish Public Oversight Board so as to operate in the Turkish Audit Market. To be able to sign an audit report, an auditor should be an engagement partner, and have a minimum of 10 years' experience in an audit firm (The Law of SMMM&YMM (1989), Capital Market Law of Turkey (2012), Independent Audit Standard 220 of Turkey (2013)). According to Public Oversight Board of Turkey (2017)'s statistics, 17,606 auditors and 252 audit firms are authorized, and 15,666 authorized auditors are registered by the Public Oversight Board of Turkey.

Türel, Türel, and Çiftçi (2017) stated that big4 audit firms (Deloitte, KPMG, PwC and Ernst&Young) dominated the Turkish audit market between 2006 and 2015 and 52% of firms were audited by these audit firms. There are no regulations limiting the number of clients an auditor/audit firm can work with. (Appendix A produced by the author presents the number of audit firms and auditors who audited financial statements between 2010 and 2016.) 1,342 observations were audited by 151 auditors. These numbers vary from year to year. A total of 63 audit firms audited the financial statements of 1,342 observations between 2010 and 2016. Also, these numbers vary from year to year. For example, there were 35 non-big4 audit firms which audited firms' financial statements in 2014 (a total of 39 audit firms including big4 audit firms). These figures seem quite low compared to the Public Oversight Board's statistics as the Board states that there are 17,606 authorized auditors and 252 authorized audit firms in 2017. The results in appendix A also indicate that big4 audit firms and their partners (auditors) dominate the Turkish audit market. The partners (auditors) in big4 audit firms seem to be busier than those in non-big4 audit firms.

3. Literature review and hypothesis development

Recent studies in auditing research have focused on the relationship between auditor-specific characteristics and AQ, which are measured as audit opinion, earnings management, audit report aggressiveness, and other outputs at firm-specific level. Most recent studies also emphasize the effect of auditor busyness at individual level on AQ although the busyness effect was studied extensively in corporate governance literature.

From the theoretical perspective, it can be said that agency theory directs the studies about busyness. In corporate governance literature, busy directors create an agency problem (Tarkovska, 2013), they increase agency costs due to the lack of effective monitoring (Core, Holthausen, & Larcker, 1999; Fich & Shivdasani, 2006; Shivdasani & Yermack, 1999) and they may neglect their duties (Ferris,

Jagannathan, & Pritchard, 2003; Tarkovska, 2013). The reflection of the theory can be seen in busyness studies in auditing literature which commonly follow this point of view and theoretical background.

To the best of my knowledge, Sundgren and Svanström (2014) are the first authors who empirically present the impact of auditor busyness on AQ in the audit literature. Their research covers the association between auditor busyness and going-concern opinion which is used as the measure of auditor quality. They stated that increases in the number of clients of the auditor impair AQ because a large number of clients leads to auditors spending less time per client. According to them, spending less time per client is not sufficient to understand the client's affairs and audit the client's financial statements efficiently and competently. Lai et al. (2016) also examined the effect of auditor busyness on earnings quality using Malaysian publicly listed firms between 2010 and 2013. They found and remarked that auditors with multiple clients provide lower AQ and they are insufficient to detect earnings management. This is because busy auditors may exert inconsiderable effort and have inadequate focus to detect earnings management practices. Goodwin and Wu (2016) investigated the relationship between multiple clients and AQ using Australian firms for the 1999–2010 period. In their paper, AQ is measured by discretionary accruals, going concern audit opinion, going concern accuracy and small profits. They stated that there is no cross-sectional association between the auditor's number of clients and audit quality, but there was a negative and significant relationship among these variables during a period of disequilibrium (2002–2004). Auditors with multiple clients do not provide lower AQ because they have superior ability and specialization to cope with multiple clients. Likewise, auditors' ability differs in coping with the complexity of auditing multiple clients. On the other hand, this situation is reversed during a period of disequilibrium. In this period, selection of the number of clients may not be under the auditor's control and auditors may not determine and select the optimal number of clients that are suitable for their specialization and attributes. Gul et al. (2017) also researched the relation between auditor busyness and AQ. They used three measures of AQ which are earnings manipulation, meeting an earnings benchmark (small earnings) and going-concern opinion. They asserted that busy auditors may not be able to identify the problems in clients' financial reports or they may not be able to collect information regarding firms issuing a going-concern audit opinion. These kinds of relationship are more pronounced when busy auditors' tenure is short. Suzuki and Takada (2016) completed similar research in Japan. They used three measures of AQ which are discretionary accruals, restatements and going-concern opinion. They stated that auditors with multiple clients produce less effective audit services due to a lack of concentration as a result of physical and mental fatigue. Wan Hussin, Bamahros, and Shukeri (2018) researched the relation between the number of clients of an auditor and audit reporting lag. They found that the number of clients prolongs audit report lag and long tenured partners can mitigate the negative effect of busyness. Karjalainen (2011) used the number of clients of auditors (busyness) as a control variable when he explored the importance of auditor industry specialization on earnings quality in Finland, but he found that auditor busyness has no significant effect on earnings quality. Karjalainen et al. (2013) investigated the influence of female auditors on audit opinion, they documented that auditors with larger client portfolio are more prone to declare a modified audit opinion. Balsam et al. (2003) investigated the importance of auditor industry specialization on earnings management and earnings response coefficient. They employed the number of clients of an auditor as a measure of auditor industry specialization and they documented that auditor busyness has an inverse effect on earnings quality. Che et al. (2017) employed the auditor's number of clients as control variable while they tested the effect of auditor-specific characteristics (formal education, professional experience, continuing professional education) on audit effort. They documented that the auditor's number of clients influenced the accuracy of going-concern audit opinion and audit effort negatively. Hardies et al. (2016) also documented that busy auditors are less prone to express a going-concern audit opinion when they researched the effect of female auditors on audit opinion.

As stated in the above studies (Goodwin & Wu, 2016; Gul et al., 2017; Lai et al., 2016; Sundgren & Svanström, 2014; Suzuki & Takada, 2016), “busy auditors do not have enough time to understand

clients' business and financial statements and are less likely to issue going-concern audit opinion and they do not have enough time to collect information about client or they may not detect earnings management practices because of a focus problem." In the current study, I also expect that busy auditors provide low qualified audit works in terms of audit opinion and audit report aggressiveness as stated in the above studies.

In recent studies on AQ, some of the attributes related to auditors attracted more attention than some of the characteristics related to audit firms. Auditor formal education level is one of the major attributes to determine and conduct AQ (Yan & Xie, 2016) and it is still one of the most prominent subjects in research about it, even though there are limited studies regarding the effect of auditor formal education level on AQ. Che et al. (2017) asserted that the general knowledge level of auditors with master's degrees is more than the general knowledge level of auditors with bachelor's degrees. More knowledgeable auditors ask more critical questions and collect more evidence when performing an audit task, and they detect misstatements more effectively. Ye et al. (2014) stated that auditors with master's degrees are less likely to be associated with audit failure because higher education level enhances their professional capabilities and helps to raise audit knowledge. Cahan and Sun (2015) approached the situation from upper echelon theory and they stated that post-graduate degrees may affect auditor's decision-making process because education level reflects auditor's knowledge and skills (Hambrick & Mason, 1984). But, they found no association between auditor's education level and audit quality. Sutaryo and Lase (2016) asserted that auditors with accounting education present financial statements in a timely fashion due to their familiarity with financial statements. Bröcheler et al. (2004) stated that education has a positive impact on audit firm performance because more educated auditors are more capable and perform better. Based on prior studies, Ocak and Kurt (2018) hypothesized and found that highly educated auditors are more likely to issue a modified audit opinion in Turkey, because they are more competent and capable than their counterparts, these features make them more conservative. Contrary to general opinion, Gul, Wu, and Yang (2013) stated that auditors with post-graduate degree are more aggressive because they earn more and have greater opportunities to find a new job. Research regarding auditor education level, as stated above, mostly indicates the positive impact of education level on audit quality.

Some prior studies (e.g. Lunau, Siegrish, Dragano, & Wahrendohf, 2015) in managerial and behavioural sciences suggest that education level and individual knowledge reduce stress. As education level increases, the stress level of people decreases because more educated people are more likely to ease the negative effect of stress and higher education level helps individuals cope with stress-related problems (Eğin, 2015). Chang and Taylor (2013) stated that higher education level promoted the efficacy of self-assistance strategies in stress alleviation. Michael et al. (2009) stated that educational background has a negative relationship with stress, because people with higher education are more optimistic and have more resources to cope with stressful situations than people with a lower level of education. On the other hand, Ross and Reskin (1992) asserted that well educated people provide control over the work process and control over others. Workload as a stressor (Nor, 2011; Smith et al., 2010) inversely affects audit quality in terms of audit opinion, discretionary accruals, small profits and reporting lag (Gul et al., 2017; Lai et al., 2016; Suzuki & Takada, 2016; Wan Hussin et al., 2018). But the education level of auditors may be one of the significant factors in coping with the complexity and stress of multiple clients. Educated auditors are more capable (Bröcheler et al., 2004; Ye et al., 2014) and knowledgeable (Che et al., 2017), and more familiar with financial statements (Sutaryo & Lase, 2016). These features can help them use their time more efficiently and help them overcome the problems that can result from lack of time. Highly educated auditors exert more effort (Che et al., 2017), but auditors with multiple clients are likely to dissipate their efforts (Lai et al., 2016). "Greater audit effort is likely to improve audit quality by increasing the possibility that an auditor can detect existing problems (Lai et al., 2016)." Besides, highly educated people might be more optimistic and have more resources to cope with stressful situations (Michael et al., 2009) and have more control of their work (Ross & Reskin, 1992) as

stated in previous studies outside accounting and auditing studies. Thus, the argument is built that auditor formal education level has an effect on the relationship between auditor busyness and audit quality in this study. I suggest that auditor education level minimises the negative effect of busyness on audit quality. To test my hypothesis, I created interaction variables using auditor busyness and auditor education level and then I divided the sample by education level. These subsamples comprise more educated auditors and less educated auditors. My expectation is that education level minimises the negative effect of busyness on audit quality and the negative effect of busyness on AQ is more pronounced only in the subsample of less educated auditors. The unique hypothesis is as follows:

Hypothesis 1 (H₁): Education level minimises the negative effect of auditor busyness on AQ.

4. Research design

4.1. Sample selection

In the study, Borsa İstanbul firms were examined to test the hypotheses. 514 firms were listed on Borsa İstanbul as of 31 December 2016. The initial sample covers 3,568 observations (514 firms × 7 years). The final sample covers 1,342 observations to test the influences of auditor busyness on audit opinion and audit report aggressiveness from 2010 to 2016. Financial firms such as banking, insurance firms, holdings, investment trusts, and investment funds were excluded because of different regulations and different financial and asset structures (1,512 observations). I did not reach some firms' audit reports (344 observations), and also did not obtain information regarding some auditor attributes (134 observations). I did not reach some information concerning control variables (246 observations). The sample includes manufacturing, trading, technology and service industries.

Busyness variables were collected manually. I obtained the auditors names from firm audit reports. Audit reports were obtained from the Public Disclosure Database (2017) (<http://www.kap.org.tr>) and then the auditors' resumes were collected from the audit firms' corporate websites and LinkedIn. I manually obtained information regarding education level from their resumes. Auditor tenure was manually calculated, and this information was obtained from firms' audit reports.

Control variables such as firm size, leverage, audit firm type (Big4 or Non-Big4), ROA (Return on assets), MTB (Market to book value), growth percentage, inventory + receivable percentage, and firm age were obtained from FINNET database (2017), firm financial statements, and firm audit reports.

4.2. Model specification

The following model is specified to test the impact of auditor education level on the relationship between auditor busyness on AQ. Two measures of AQ, which are modified audit opinion and audit report aggressiveness, are used as dependent variables.

$$\begin{aligned} AQ_{it} = & \beta_0 + \beta_1 AuditorBusy_{it} (Or \ LogAuditorBusy_{it}) + \beta_2 Postgraduate_{it} + \beta_3 AuditorBusy_{it} \\ & * Postgraduate_{it} (Or \ LogAuditorBusy_{it} * Postgraduate_{it}) + \beta_4 TenureA_{it} + \beta_5 Big4_{it} \\ & + \beta_6 LogSize_{it} + \beta_7 MTB_{it} + \beta_8 Leverage_{it} + \beta_9 Growth_{it} + \beta_{10} InvRec_{it} + \beta_{11} LogAge_{it} \\ & + \beta_{12} ROA_{it} + \beta_{13} Loss_{it} + Year \ Fixed + Sector \ Fixed + e_{it} \end{aligned} \quad (1)$$

I expect the coefficients of θ_1 and θ_2 to be negative and positive (positive and negative) respectively in terms of audit opinion (audit report aggressiveness). If the hypothesis is supported, the coefficient of interaction variables (θ_3) will be positive (negative) in terms of audit opinion (audit report aggressiveness)

4.3. Measures of audit quality

Two measures are used in this paper for AQ. They are audit opinion, and audit report aggressiveness, respectively. These variables are explained in the following headings.

4.3.1. Audit opinion

In the literature about AQ, audit opinion is considered a sign of AQ (Goodwin & Wu, 2016; Gul et al., 2017). Gul et al. (2017) stated that auditors should exert more effort and should collect more information about their clients to express a going concern opinion. Thus, expressing a going concern opinion may be used as a measure of higher AQ. In my opinion, this may also apply to all types of audit opinions other than clean opinion. In this paper, modified audit opinion (*Modified*) is used as the measure of AQ (some authors such as Chen, Sun, and Wu (2010), Farinha and Viana (2009) also used modified audit opinion as a measure of AQ). The expectation is that auditors with multiple clients are less prone to declare a modified audit opinion as stated in Gul et al. (2017) and this issue is more pronounced in the case of less experienced auditors. *Modified* is equal to 1 if the opinion regarding firm's financial statement is a modified opinion, otherwise 0.

4.3.2. Audit report aggressiveness

The value of audit report aggressiveness (*Agg*) is obtained from the following logistic prediction model. The difference between predicted opinion (*Pre_Modified_{it}*) and actual opinion (*Modified_{it}*) indicates audit report aggressiveness (*Agg*). Higher values of aggressiveness indicate that auditors are more likely to express a clean opinion (Cahan & Sun, 2015; Chen, Dai, Kong, & Tan, 2017; Gul et al., 2013). In this paper, audit report aggressiveness (*Agg*) is used as the measure of AQ (Equation 3).

$$\begin{aligned} \text{Modified}_{it} = & \beta_0 + \beta_1 \text{Quick}_{it} + \beta_2 \text{Receivable, OtherReceivable, Inventory}_{it} / \text{TotalAssets}_{it} \\ & + \beta_3 \text{ROA}_{it} + \beta_4 \text{Loss}_{it} + \beta_5 \text{Leverage}_{it} + \beta_6 \text{LogSize}_{it} + \beta_7 \text{LogAge}_{it} \\ & + \text{Sector Fixed} + e_{it} \end{aligned} \quad (2)$$

$$\text{Agg}_{it} = \text{Pre_Modified}_{it} - \text{Modified}_{it} \quad (3)$$

4.4. Measures of the variables of interest

Firstly, the raw form of auditor busyness (*AuditorBusy*) is used as stated in papers by Gul et al. (2017), Lai et al. (2016), Karjalainen (2011) and Sundgren and Svanström (2014). I identified whole firms listed on Borsa İstanbul for each year. Then, firm audit reports were accessed and the auditors who signed the audit reports were identified. Finally, the total number of firms audited by each auditor was determined. Auditor busyness (*AuditorBusy*) is measured as the total number of clients of an auditor for each year. Based on the literature (e.g. Goodwin & Wu, 2016; Karjalainen et al., 2013), I also employed the logarithmic form of auditor busyness (*LogAuditorBusy*). Auditor education level (*Postgraduate*) is the other variable of interest in this study. I obtained the names of engagement partners from firms' audit reports. Then, I manually obtained information regarding auditor formal education level from their resumes and LinkedIn. *Postgraduate* is equal to 1 if the engagement partner holds a master's or Ph.D. in accounting, auditing or related fields. Lastly, I created interaction variables using the raw form of auditor busyness (*AuditorBusy*), the logarithmic form of auditor busyness (*LogAuditorBusy*) and auditor formal education level (*Postgraduate*). These are *AuditorBusy*Postgraduate* and *LogAuditorBusy*Postgraduate*. These variables are interaction variables indicating whether busy and more educated auditors enhance audit quality or whether the negative effect of busyness on AQ is valid when the engagement partner holds a master's or Ph.D.

4.5. Control variables

Following previous studies, I use some firm-specific and auditor-specific characteristics while testing the effect of auditor busyness on AQ.

The relationship period between auditor and auditee may be important for auditor independence. Long tenured auditors may be less independent, and they provide lower AQ (Chen et al., 2017; Chi & Huang, 2005; Ye, Carson, & Simnett, 2011). The audit literature presents many findings regarding big4 firms' AQ and they provide more qualified audit service (Gul et al., 2013; Imam, Zahir Uddin, & Khan, 2001; Ng & Tai, 1994). Auditor tenure (*TenureA*) is calculated as the total length of the engagement partner and client relationship. *Big4* is equal to 1 if the audit firm is one of the big4 audit firms (Deloitte, KPMG, PwC, EY), otherwise 0.

Following prior research on AQ (Anagnostopoulou & Tsekrekor, 2017; AlNajjar & Riahi-Belkaoui, 2001; Chen, Chen, & Su, 2001; Chen et al., 2010; DeFond, Wong, & Li, 2000; Gul et al., 2013; Sonu, Choi, Lee, & Ha, 2016), some firm-specific characteristics (return on assets—ROA, firm size—LogSize, leverage—Leverage, inventory + receivable percentage -InvRec, firm age—LogAge, sales growth—Growth, market to book value—MTB and loss- Loss) are controlled in the study because they affect AQ. I also kept years and sectors fixed because of their potential effects. LogSize is the natural logarithm of total assets. Loss is equal to 1 if firm reported loss. Leverage is equal to total liabilities divided by total assets. InvRec is the ratio of the sum of inventory and accounts receivable to total assets. LogAge is the natural logarithm of number of years since formation. Growth is equal to the change in sales. MTB is equal to market value to book value ratio.

Continuous variables are winsorized in order to control for outliers.

5. Results

The following sections cover descriptive statistics, correlation matrix, and estimation results.

5.1. Descriptive statistics and univariate analysis

Table 1 introduces the basic statistics and univariate analysis for the variables that are used in estimation models regarding audit opinion (*Modified*) and audit report aggressiveness (*Agg*) samples.

The mean values of audit opinion (*Modified*), audit report aggressiveness (*Agg*), and the average number of clients of auditors (*AuditorBusy*) are respectively equal to 0.102, -0.004 and 5.351. The average number of clients per auditor is about 5 clients. Firms are generally audited by big4 audit firms (mean values of Big4 are 0.564). The mean value of education level (*Postgraduate*) is 0.193. The results of univariate analysis indicate that the mean values of modified audit opinion (*Modified*) and the number of clients of auditor (*AuditorBusy* & *LogAuditorBusy*) with education level (*Postgraduate* = 1) are higher than the mean values of modified audit opinion (*Modified*) and the number of clients of auditor (*AuditorBusy* & *LogAuditorBusy*) with education level (*Postgraduate* = 0). On the other hand, the mean

Table 1. Descriptive statistics and univariate analysis

Variables	Whole sample		Postgraduate = 0		Postgraduate = 1		Mean difference
	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.	
Modified	0.102	0.303	0.095	0.293	0.134	0.341	-1.88**
Agg	-0.004	0.278	-0.0008	0.008	-0.019	0.017	0.95
AuditorBusy	5.351	3.594	5.256	0.108	5.750	0.226	-1.99**
LogAuditorBusy	1.450	0.713	1.435	0.021	1.509	0.046	-1.49**
Postgraduate	0.193	0.395	-	-	-	-	
TenureA	2.242	1.388	3.153	0.059	3.065	0.120	0.65
Big4	0.564	0.496	0.612	0.014	0.361	0.029	7.48***
LogSize	19.53	1.748	19.62	0.053	19.19	0.106	3.56***
MTB	0.022	0.039	0.022	0.001	0.021	0.003	0.45
Leverage	0.484	0.232	0.487	0.007	0.472	0.014	0.91
Growth	0.425	5.967	0.480	0.201	0.197	0.050	0.68
InvRec	0.336	0.198	0.337	0.005	0.332	0.012	0.38
LogAge	3.503	0.521	3.516	0.015	3.446	0.034	1.93**
ROA	0.035	0.100	0.034	0.002	0.022	0.006	1.78**
Loss	0.296	0.454	0.293	0.013	0.276	0.027	0.54
Obs.	1,342	1,342	1,082	1,082	260	260	

value of big4 audit firms (*Big4*) with education level (*Postgraduate* = 1) is less than the mean value of big4 audit firms (*Big4*) with education level (*Postgraduate* = 0). This result indicates that auditors in big4 audit firms have less formal education level than auditors in non-big4 audit firms. Though higher quality college graduates tend to work in big4 audit firms, working in big4 audit firms may not allow them to pursue a post-graduate degree because of heavy workload. Table 2 introduces the total number of clients of auditors for each year. These findings are slightly different from results in Lai et al. (2016) and Wan-Hussin, Bamahros, and Shukeri (2016). In their papers, the client number ranges from 1 client to 15 clients in Lai et al. (2016) and from 1 client to 32 clients in Wan-Hussin et al. (2016). Moreover, Türel et al. (2017) found that client number ranges from 1 client to 20 clients between 2006 and 2015 and their findings are similar to my findings regarding the client number range.

5.2. Correlation matrix

Table 4 presents the correlation coefficient results of the Pearson test. In Tables 3 and 4, there are high correlations between some variables (for example, the correlation coefficient between auditor busyness (*AuditorBusy*) and the logarithmic value of auditor busyness (*LogAuditorBusy*) is 0.90. Besides, the correlation coefficient between modified audit opinion (*Modified*) and audit report aggressiveness (*Agg*) is -0.93. Gujarati and Porter (2012) state that high correlation coefficient is a major problem, and this induces the presence of collinearity. I did not use highly correlated variables in the same model to overcome the collinearity problem.

5.3. Regression results

This section covers my main estimation results.

5.3.1. Main results

Table 4 presents logistic regression and OLS estimation results. Four columns on the left side of Table 4 (Column 1, 2, 3 and 4) show the influences of auditor busyness (*AuditorBusy*, *LogAuditorBusy*), education level (*Postgraduate*) and busy&more educated auditors (*AuditorBusy*Postgraduate* & *LogAuditorBusy*Postgraduate*) on audit opinion (*Modified*). Four columns on the right side of Table 4 (Column 5, 6,7 and 8) introduce the effect of auditor busyness (*AuditorBusy*, *LogAuditorBusy*), education level (*Postgraduate*) and busy&more educated auditors (*AuditorBusy*Postgraduate* & *LogAuditorBusy* Postgraduate*) on audit report aggressiveness (*Agg*).

My first finding is that the number of clients of an auditor (Raw form: *AuditorBusy* and logarithmic form: *LogAuditorBusy*) negatively and significantly affects audit opinion (*Modified*) (-0.0791, -0.362, -0.127, -0.512). Education level (*Postgraduate*) is positively associated with audit opinion (*Modified*) (0.464, 0.458). The coefficients of interaction variables (*AuditorBusy*Postgraduate*, *LogAudiorBusy*Postgraduate*) are positive and significant (0.148, 0.551). These findings show that busy auditors (more educated auditors) are less (more) prone to express a modified audit opinion. More clients (more educated auditors) lead to a decrease (an increase) in AQ when audit opinion is used as the measure of AQ. The positive and significant coefficients of *AuditorBusy*Postgraduate* and *LogAuditorBusy*Postgraduate* suggest that education level (*Postgraduate*) minimises the negative effect of auditor busyness on modified audit opinion.

Another finding demonstrates that there is a positive and significant relationship between the number of clients of an auditor (Raw form: *AuditorBusy* and logarithmic form: *LogAuditorBusy*) and audit report aggressiveness (*Agg*) (0.00346, 0.0173, 0.00471, 0.0219). Education level (*Postgraduate*) is also negatively and significantly associated with audit opinion (*Modified*) (-0.0222, -0.0225). The interaction variables (*AuditorBusy*Postgraduate* and *LogAuditorBusy*Postgraduate*) are negatively associated with audit report aggressiveness but this is only significant for *AuditorBusy*Postgraduate*. These results infer that busy auditors (more educated auditors) are more aggressive (conservative) and the negative and significant coefficient

Table 2. Number of clients of auditors, auditors with post-graduate degree, auditors with Bachelor's degree

No. of C.	2010			2011			2012			2013			2014			2015			2016			Total		
	T	1	0	T	1	0	T	1	0	T	1	0	T	1	0	T	1	0	T	1	0	T	1	0
1	20	4	16	22	3	19	19	4	15	22	3	19	17	5	12	18	5	13	25	6	19	143	30	113
2	9	1	8	16	6	10	26	3	23	23	6	17	20	3	17	26	5	21	15	1	14	135	26	109
3	26	5	21	11	7	4	15	3	12	25	6	19	28	5	23	21	0	21	23	5	18	149	31	118
4	17	5	12	33	4	29	22	0	22	32	2	30	34	2	32	36	4	32	42	0	42	216	17	199
5	16	4	12	8	0	8	46	9	37	25	3	22	26	0	26	27	2	25	21	5	16	169	23	146
6	24	2	22	26	8	18	21	7	14	12	0	12	22	3	19	22	10	12	7	0	7	134	30	104
7	27	14	13	10	4	6	11	0	11	29	4	25	10	3	7	15	0	15	21	0	21	123	25	98
8	7	5	2	19	6	13	5	5	0	6	4	2	6	0	6	12	4	8	13	0	13	68	24	44
9	3	0	3	20	6	14	14	6	8	12	5	7	21	6	15	1	0	1	10	0	10	81	23	58
10	-	-	-	8	5	3	-	-	-	10	7	3	-	-	-	11	0	11	16	5	11	45	17	28
11	-	-	-	-	-	-	5	0	5	-	-	-	-	-	-	-	-	-	12	5	7	17	5	12
13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	11	0	11	-	-	-	11	0	11
14	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4	0	4	4	0	4
16	-	-	-	-	-	-	-	-	-	10	0	10	-	-	-	-	-	-	-	-	-	10	0	10
17	-	-	-	-	-	-	13	0	13	-	-	-	4	4	0	-	-	-	-	-	-	17	4	13
18	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5	5	0	-	-	-	5	5	0
20	-	-	-	-	-	-	-	-	-	-	-	-	15	0	15	-	-	-	-	-	-	15	0	15
Total	149	40	109	173	49	124	197	37	160	206	41	165	203	31	172	205	35	170	209	27	182	1,342	260	1,082

Note: T: Total Number of auditors, 1: Auditors with post-graduate degree, 0: Auditors with bachelor's degree, No. of C.: Number of Clients.

Table 3. Correlation matrix

	Modified	Agg	Auditor Busy	Log Auditor Busy	Post graduate	TenureA	Big4	Leverage	Growth	Invrec	MTB	LogSize	Loss	ROA	Log Age
Modified	1														
Agg	-0.933***	1													
Auditor Busy	-0.0665**	0.0601**	1												
LogAuditor Busy	-0.0895***	0.0649**	0.900***	1											
Post graduate	0.0547**	-0.0407	0.051*	0.0363	1										
TenureA	-0.0876***	0.0400	-0.027	-0.008	-0.0114	1									
Big4	-0.147***	0.0344	-0.006	0.162***	-0.170***	0.116***	1								
Leverage	0.0233	-0.0130	-0.0477*	-0.028	-0.0191	0.0448*	0.0569**	1							
Growth	0.0465*	-0.0507*	-0.0282	-0.027	-0.0186	0.110***	-0.009	0.0124	1						
Invrec	-0.0847***	0.0769***	0.0309	0.0224	-0.0155	0.0191	-0.0581**	0.212***	0.012	1					
MTB	-0.0282	0.0397	-0.009	-0.002	-0.0111	0.0158	0.141***	0.162***	-0.001	0.0232	1				
LogSize	-0.2228***	-0.0301	-0.007	0.0783***	-0.0868***	0.176***	0.467***	0.241***	-0.047*	-0.104***	0.0137	1			
Loss	0.164***	-0.0164	-0.0518*	-0.067**	-0.0152	-0.0405	-0.134***	0.307***	0.052**	-0.130***	0.0435	-0.207***	1		
ROA	-0.146***	0.0196	0.0749***	0.090***	-0.0183	0.0474*	0.201***	-0.436***	-0.055**	0.0687***	0.00462	0.193***	-0.774***	1	
LogAge	-0.0635**	0.0299	-0.026	0.062**	-0.0356	0.123***	0.348***	-0.0551**	-0.033	-0.0251	0.0665**	0.254***	-0.09***	0.148***	1

Note: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table 4. Results for busyness, education level and interaction variables

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Variables	Modified	Modified	Modified	Modified	Agg	Agg	Agg	Agg
Constant	6.745*** (2.069)	6.680*** (2.066)	6.991*** (2.073)	6.886*** (2.072)	0.216** (0.107)	0.209* (0.108)	0.212** (0.107)	0.203* (0.108)
AuditorBusy	-0.0791*** (0.0291)		-0.127*** (0.0375)		0.00346*** (0.00126)		0.00471*** (0.00140)	
LogAuditorBusy		-0.362*** (0.130)		-0.512*** (0.153)		0.0173*** (0.00632)		0.0219*** (0.00705)
Postgraduate	0.464* (0.241)	0.458* (0.241)	-0.299 (0.406)	-0.293 (0.475)	-0.0222* (0.0117)	-0.0225* (0.0117)	0.0139 (0.0214)	0.0105 (0.0253)
AuditorBusy*Postgraduate			0.148** (0.0613)				-0.00639** (0.00316)	
LogAuditorBusy*Postgraduate				0.551* (0.292)				-0.0223 (0.0152)
TenureA	-0.171*** (0.0633)	-0.169*** (0.0632)	-0.172*** (0.0637)	-0.170*** (0.0634)	0.00606** (0.00247)	0.00604** (0.00247)	0.00591** (0.00247)	0.00596** (0.00247)
Big4	-0.106 (0.248)	-0.0410 (0.252)	-0.0973 (0.249)	-0.0317 (0.253)	0.0111 (0.0110)	0.00701 (0.0111)	0.0128 (0.0110)	0.00774 (0.0111)
Leverage	1.361** (0.537)	1.376** (0.537)	1.386** (0.541)	1.411*** (0.538)	-0.0218 (0.0263)	-0.0222 (0.0263)	-0.0220 (0.0263)	-0.0229 (0.0263)
Growth	0.0276* (0.0155)	0.0276* (0.0150)	0.0268* (0.0153)	0.0271* (0.0147)	-0.00187** (0.000770)	-0.00187** (0.000770)	-0.00183** (0.000770)	-0.00185** (0.000770)
Invrec	-3.440*** (0.640)	-3.379*** (0.637)	-3.605*** (0.652)	-3.511*** (0.646)	0.0789*** (0.0267)	0.0786*** (0.0267)	0.0812*** (0.0267)	0.0804*** (0.0267)
MTB	-2.405 (3.316)	-2.459 (3.289)	-2.119 (3.306)	-2.298 (3.335)	0.136 (0.118)	0.142 (0.119)	0.124 (0.118)	0.132 (0.119)

(Continued)

Table 4. (Continued)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Variables	Modified	Modified	Modified	Modified	Agg	Agg	Agg	Agg
LogSize	-0.526*** (0.0930)	-0.527*** (0.0930)	-0.517*** (0.0928)	-0.524*** (0.0928)	-0.00804** (0.00397)	-0.00816** (0.00397)	-0.00825** (0.00397)	-0.00826** (0.00397)
Loss	0.574 (0.353)	0.576 (0.353)	0.556 (0.355)	0.555 (0.355)	-0.00193 (0.0158)	-0.00173 (0.0158)	-0.00213 (0.0157)	-0.00168 (0.0158)
ROA	0.414 (2.675)	0.366 (2.675)	0.263 (2.688)	0.278 (2.677)	-0.0225 (0.116)	-0.0172 (0.116)	-0.0269 (0.116)	-0.0209 (0.116)
LogAge	-0.213 (0.198)	-0.167 (0.195)	-0.288 (0.205)	-0.204 (0.200)	0.0137 (0.0101)	0.0129 (0.0101)	0.0146 (0.0101)	0.0134 (0.0101)
Year Fixed	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Sector Fixed	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Clustered by Firm	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1,342	1,342	1,342	1,342	1,342	1,342	1,342	1,342
Pseudo R ² & R ²	0.205	0.204	0.211	0.208	0.035	0.035	0.038	0.036
LR Chi ² & F Value	187.10***	186.72***	192.79***	190.33***	2.01***	2.00***	2.09***	2.01***

Note: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

of AuditorBusy*Postgraduate suggests that education level minimises the negative effect of auditor busyness on audit report aggressiveness.

These results are consistent with prior research. As stated in the literature review (Goodwin & Wu, 2016; Gul et al., 2017; Lai et al., 2016; Sundgren & Svanström, 2014; Suzuki & Takada, 2016), busy auditors do not have enough time to understand clients' business and financial statements and they do not have enough time to collect information about client. They provide low qualified audit services. The results about auditor educational level are consistent with prior research regarding the effect of auditor education on audit quality. They provide high quality audit services because they are more competent and capable (Che et al., 2017; Ocak & Kurt, 2018; Ye et al., 2014). Above all, results regarding interaction variables are consistent with conjecture. Highly educated auditors are more optimistic and have more resources to cope with stressful situations (Michael et al., 2009) and have more control of their work (Ross & Reskin, 1992). Besides, becoming more knowledgeable, capable and competent can help them use their time more efficiently and help them overcome the problems that can result from time insufficiency. On the other hand, as stated in Che et al. (2017) and Lai et al. (2016)'s studies, highly educated auditors exert more effort, greater audit effort is likely to improve audit quality and educated but busy auditors exerting great effort might minimise the negative effect of auditor busyness on audit quality.

Considering the other control variables, auditor tenure (*TenureA*), firm size (*LogSize*) and inventory + receivable ratio (*Invrec*) are negatively associated with modified audit opinion firm size (*LogSize*). Long-tenured auditors are less likely to issue a modified audit opinion because they are less independent in a long-term relationship. *Leverage* and *growth* are positively associated with modified audit opinion. Highly leveraged firms are more prone to receive a modified audit opinion. On the other hand, auditor tenure (*TenureA*) and inventory + receivable ratio (*Invrec*) positively and significantly affect audit report aggressiveness (*Agg*). Firm size (*LogSize*) and growth (*Growth*) are inversely related to audit report aggressiveness. Long-tenured auditors are more aggressive when they fulfil audit work.

5.3.2. Results for subsamples (Less educated auditors vs more educated auditors)

For sensitivity check, regressions of the subsamples were performed (less educated auditors vs. more educated auditors). Thus, I examine how auditor busyness affects AQ for more educated auditors and less educated auditors.

In Table 5, there is a negative and significant association between auditor busyness (Raw form: *AuditorBusy* and Logarithmic form: *LogAuditorBusy*) and audit opinion (*Modified*) in the subsample of less educated auditors (*Postgraduate* = 0) (-0.145, -0.581). But I did not find any significant relationship between auditor busyness (Raw form: *AuditorBusy*, Logarithmic form: *LogAuditorBusy*) and audit opinion (*Modified*) in the subsample of more educated auditors (*Postgraduate* = 1). These findings reveal that busy auditors are less likely to express a modified audit opinion and this relation indicates that auditor busyness negatively and significantly affects AQ (*Modified*) if auditors are less educated. More educated auditors may cope with the complexity and stress of multiple clients because they have more control of their work than less educated auditors. Busyness by itself is not a critical factor affecting AQ negatively if auditors are more educated. In Table 5, busy auditors (Raw form: *AuditorBusy* and logarithmic form: *LogAuditorBusy*) are more aggressive when they express a modified audit opinion in the subsample of less educated auditors (*Postgraduate* = 0) (0.00879, 0.0448). I did not find any significant relationship in the subsample of more educated auditors (*Postgraduate* = 1). These results support my findings regarding audit opinion and indicate that busyness by itself is not a critical factor affecting AQ negatively if auditors are more educated.

Table 5. Results for subsamples (less educated auditors vs. more educated auditors)

Variables	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
	Post graduate = 0 Modified	Post graduate = 0 Modified	Post graduate = 1 Modified	Post graduate = 1 Modified	Post graduate = 0 Agg	Post graduate = 0 Agg	Post graduate = 1 Agg	Post graduate = 1 Agg
Constant	9.439*** (2.220)	9.256*** (2.218)	13.96** (6.189)	14.63** (6.240)	-0.0675 (0.164)	-0.0723 (0.164)	0.118 (0.334)	0.0935 (0.334)
AuditorBusy	-0.145*** (0.0399)		0.0266 (0.0685)		0.00879*** (0.00237)		-0.000356 (0.00510)	
LogAuditorBusy		-0.581*** (0.160)		-0.0642 (0.360)		0.0448*** (0.0121)		0.0136 (0.0255)
TenureA	-0.273*** (0.0763)	-0.271*** (0.0757)	0.346** (0.166)	0.353** (0.169)	0.0164*** (0.00466)	0.0165*** (0.00466)	-0.0180* (0.0107)	-0.0179* (0.0106)
Big4	0.120 (0.286)	0.209 (0.291)	-0.663 (0.812)	-0.558 (0.828)	0.00723 (0.0209)	-0.00441 (0.0210)	0.0427 (0.0444)	0.0364 (0.0450)
Leverage	0.643 (0.662)	0.643 (0.657)	4.184** (1.628)	4.112** (1.622)	0.0168 (0.0510)	0.0159 (0.0510)	-0.167* (0.0986)	-0.165* (0.0985)
Growth	0.0248 (0.0177)	0.0255 (0.0167)	1.135** (0.504)	1.119** (0.497)	-0.00218* (0.00127)	-0.00219* (0.00127)	-0.0803*** (0.0239)	-0.0802*** (0.0239)
Invrec	-2.711*** (0.767)	-2.581*** (0.757)	-10.51*** (2.578)	-10.39*** (2.586)	0.0487 (0.0507)	0.0489 (0.0508)	0.456*** (0.117)	0.451*** (0.117)
MBV	-1.615 (3.373)	-1.883 (3.441)	-29.66 (18.29)	-29.13 (17.90)	0.229 (0.236)	0.248 (0.236)	0.535 (0.387)	0.562 (0.388)
LogSize	-0.454*** (0.105)	-0.466*** (0.106)	-1.103*** (0.292)	-1.123*** (0.294)	-0.0118 (0.00744)	-0.0119 (0.00744)	0.00433 (0.0163)	0.00446 (0.0163)
Loss	0.430 (0.416)	0.429 (0.415)	1.622* (0.964)	1.654* (0.964)	0.00996 (0.0297)	0.0105 (0.0297)	-0.0329 (0.0653)	-0.0337 (0.0653)

(Continued)

Table 5. (Continued)

	(9) Post graduate = 0	(10) Post graduate = 0	(11) Post graduate = 1	(12) Post graduate = 1	(13) Post graduate = 0	(14) Post graduate = 0	(15) Post graduate = 1	(16) Post graduate = 1
Variables	Modified	Modified	Modified	Modified	Agg	Agg	Agg	Agg
ROA	-1.546 (3.144)	-1.639 (3.138)	5.827 (7.313)	5.813 (7.300)	0.0297 (0.220)	0.0438 (0.220)	-0.253 (0.455)	-0.245 (0.455)
LogAge	-0.423* (0.247)	-0.291 (0.236)	0.534 (0.752)	0.529 (0.737)	0.0310 (0.0195)	0.0284 (0.0195)	-0.000726 (0.0368)	-0.00231 (0.0369)
Year Fixed	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Sector Fixed	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Clustered by Firm	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1,082	1,082	260	260	1,082	1,082	260	260
Pseudo R ² & R ²	0.209	0.205	0.449	0.448	0.050	0.050	0.146	0.147
LR Chi ² & F Value	141.48***	138.81***	84.85***	84.73***	2.43***	2.43***	1.76***	1.77***

Note: * p < 0.10, ** p < 0.05, *** p < 0.01.

6. Conclusion

This paper investigates the effect of the number of clients of an auditor and auditor education level on AQ. Prior research only focused on the relationship between the number of clients of auditors and audit quality. This study concentrated on the moderating role of auditor formal education level on the relationship between auditor busyness and audit quality and tried to fill the gap in literature regarding it. Modified audit opinion and audit report aggressiveness are used as the measures of AQ. I mainly used logistic and OLS estimation to test my hypothesis. The sample was also divided into subsamples to determine the moderating effect of auditor education on the relationship between auditor busyness and AQ.

The main results show that auditors with multiple clients are less likely to issue a modified audit opinion and they are more aggressive when they issue a modified audit opinion. But, education level minimises the negative effect of auditor busyness on audit quality. Furthermore, I split the sample by using auditor education level into less educated auditors and more educated auditors. I found that the negative effect of auditor busyness on AQ is more pronounced in the case of less educated auditors. This result indicates that more educated auditors may cope with the complexity of multiple clients better than less educated auditors.

These results show that more educated auditors should have more clients than less educated auditors to enhance audit quality. Audit firms might appoint more clients to educated auditors to increase their independent audit service quality. Therefore, audit firms should give importance to the formal education of their partners and independent auditors. On the other hand, the number of clients of auditors may be limited by regulations.

7. Limitations and future research directions

This study has some limitations. I used only two different types of audit quality. The magnitudes of accruals-based or real activities-based earnings management were not used as measures of audit quality in this study. Besides, I ignored the effects of some auditor-specific characteristics such as gender, experience and certification in our estimation models. For future research, the magnitudes of accruals-based or real activities-based earnings management can be used as measures of audit quality and then the role of auditor education level on the relationship between auditor busyness and earnings quality can be determined. Besides, some different auditor-specific characteristics can be used as control variables.

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Notes

1. The engagement partner who handles large clients would like to have only a few clients, whereas the engagement partner who handles small clients would like to have many clients. I ignored this situation in this study as in previous studies.
2. In the rest of this text, the term “auditor(s)” refers to audit partner(s).

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Appendix A. The number of audit firms and auditors between 2010 and 2016

The number of audit firms between 2010 and 2016								
Type	2010	2011	2012	2013	2014	2015	2016	Total
Big4	4	4	4	4	4	4	4	4
Non -Big4	28	32	32	36	35	33	36	59
Total	32	36	36	40	39	37	40	63

The number of auditors between 2010 and 2016								
Type	2010	2011	2012	2013	2014	2015	2016	Total
Big4	32	35	40	43	44	46	43	61
Non-Big4	33	40	41	45	40	43	48	90
Total	65	75	82	88	88	89	91	151



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