

# AN EXPERIMENTAL EXAMINATION OF THE EFFECT OF CLIENT SIZE AND AUDITORS' INDUSTRY SPECIALIZATION ON TIME PRESSURE IN AUSTRALIA

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## Abstract

This paper examines how industry specialization and the size of the client affect time pressure to complete an audit. The study used a sample size of 70 auditors to examine their perceptions of time pressure in different scenarios. The results of the experiment demonstrate that industry specialization significantly reduces the level of time pressure, indicating that industry specialist auditors work more efficiently and face less time pressure compared with non-specialist auditors. No significant relationship exists between the size of the client and time pressure, indicating that audit firms are likely to possess stronger bargaining power and resist pressure from clients to reduce audit hours when auditing large companies.

**Keywords:** Time Pressure, Industry Specialization, The Size of the Client, Audit Quality

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## 1 Introduction

The aim of this paper is to examine factors that may impact time pressure. This is essential in order to improve audit performance, audit quality, and reduce litigation against auditors. Prior studies examined two types of time pressure, namely, time budget pressure and time deadline pressure. Clients increasingly demand that audit reports are completed faster and at lower cost, imposing time pressure on auditors (Low and Tan, 2011), because the audit fee billed is usually determined before audit engagement and depends on budgeted prices and budgeted hours (Hackenbrack and Hogan, 2005). Attempts to renegotiate agreed audit fees or unexpected audit-related fees trigger audit clients' to consider switching auditors (Beattie, Fearnley, and Brandt, 2000). In the competitive audit environment, auditors face increased likelihood of losing clients (Bakar, Rahman, and Rashid, 2005), and clients are considered to have greater bargaining power than auditors (Patel, Harrison, and McKinnon, 2002). Because audit clients tend to impose constraints on audit fees, audit time is compromised to improve short-term profitability of the audit firm (Houston, 1999). Time budget and time deadline become the auditors' pre-determined criteria, which are used to examine their performance (Sweeney and Pierce, 2006).

Studying industry specialization is important because companies will be able to choose between

auditors, and to regulators as industry specialization may impact on completion in the market and to auditing firm that produce high audit quality (Minutti-Meza, 2013). Further, industry specialization impacts on audit quality (Balsam, et al., 2003).

The auditing process is under constraints of labor and costs (Chou, Du, and Lai, 2007). As this paper set out to investigate the two factors –auditors' specialization and the size of the client company– that affect time pressure in audit work, it would be feasible to reduce the time pressure on auditors by improving their performance, and reducing their litigation risk. Since time pressure may lead to reduced audit quality and even audit failure, auditors, audit committees and regulators have an interest in understanding the factors that may impact on time pressure. To examine the impact of these two factors on time pressure, an experiment using 70 auditors from auditing firms in Australia was conducted. Using Analysis of Variance (ANOVA), evidence is provided that auditors' specialization reduces time pressure but no impact of client company size on time pressure is found. This result suggests that specialized auditors are more efficient than non-specialized auditors. The findings improve the understanding of the relationship between industry specialization, time pressure and client size and the consequences of using industry specialization.

The study contributes to the literature in many ways. First, Low and Tan (2011) have argued that time pressure is considered predictable and

controllable because auditors adapt their work strategies at the early stages of the audit when anticipating time pressure. However, auditors' working speed is limited and auditors often rely on audit plans from the prior year's engagement, making it hard to improve the efficiency and effectiveness of audit work by themselves (Low and Tan, 2011). Sweeney and Pierce (2004) have argued that the audit is not only affected by the experience of auditors and the time spent by audit managers to review audit work, but also by the complexity of the client business, the industry (including specialization), and the size of the audit. Therefore, understanding time pressure is important to improve auditors' efficiency and audit quality.

Second, Minutti-Meza (2013) has found no association between audit fee premium/audit quality and auditor industry specialization. The paper suggests that this lack of association is due to the limitation that archival research does not fully parse the effects of auditor industry specialization from client characteristics. The current study employs an experimental method to overcome this limitation.

Third, the results in this paper reconcile the inconsistent findings on the impact of industry specialization on audit quality. Fourth, understanding time pressure in auditing may guide auditing firms' efforts to develop appropriate training to improve auditors' ability to cope with time pressure, which may result in job satisfaction and improved performance (DeZoort and Lord, 1997).

The paper is organized as follows: the next section reports on prior literature and hypothesis development. Then the research method, results and conclusions are described and discussed.

## 2 Specialist auditors

Specialist auditors<sup>1</sup> have incentives to maintain high quality performance and protect their reputation compared with non-specialist auditors (Lim and Tan, 2010). It takes time for auditors to acquire specific knowledge about an industry and the business of their clients. Auditors who are industry specialists better understand their clients and tend to update their knowledge about that industry (Lim and Tan, 2010). As specialist auditors have sufficient information of clients' operations, they need not spend much time explaining their practices and trends and thus they can provide a higher quality audit (Mayhew and Wilkins, 2003). Furthermore, audit firms specializing in certain industries invest in more personnel and technology and are more adaptable to business changes (Lim and Tan, 2010).

An industry specialist auditor usually belongs to an audit firm that has the largest industry market share (Lim and Tan, 2008). All international audit firms have used industry knowledge and training to establish their multidisciplinary industry specialist teams (Carson, 2009). Auditors who are specialists are

exclusively assigned to clients in that industry and become very adept at addressing industry-specific audit issues (Mayhew and Wilkins, 2003). When auditors gain more client-industry knowledge, they are more efficient in delivering high-quality audit services (Carson, 2009).

Furthermore, knowledge of the client's industry helps auditors to plan audit procedures and set time budgets more effectively (Low, 2004). Industry-matched auditors have extensive knowledge of the client's industry, which makes them better able to assess audit risk, as well as making decisions to modify audit procedures, change audit personnel and set audit hours (Low, 2004).

As discussed above there are two types of time pressure, namely, time budget pressure and time deadline pressure, and it has been suggested that both types of time pressure reduce the effectiveness, efficiency and quality of audit work, and reduce audit job satisfaction (Pierce and Sweeney, 2004; Margheim, Kelley, and Pattison, 2005). When time budget is less than the time actually required to complete audit tasks, time budget pressure exists (Margheim et al., 2005). Time deadline pressure is generated when auditors have to complete the project before a deadline agreed upon by both auditors and clients (Margheim et al., 2005) and this can lead to dysfunctional behaviors and bad audit quality.

Dysfunctional behaviors due to both time budget pressure and time deadline pressure include those that do not directly affect the reliability of the audit report (i.e., under-reporting of the audit time) and those that may directly affect the audit report (i.e., signing off audit report before completion, reducing audit procedures, lack of research on accounting standards, superficial reviews of clients' documents and accepting weak explanations) (Kelley and Margheim, 1990; Sweeney and Pierce, 2004; Margheim et al., 2005). These behaviors cause audit firms to lose their effectiveness and result in distorted management information being held in the audit firm (Sweeney and Pierce, 2006).

Although the negative impact of time pressure on the audit project has been investigated, few studies have addressed the reason and the impact of time pressure. Uncertainties between clients' and auditors' perception of audit work, such as the complexity of the clients' business and the industry, make auditors' preparation for meeting time budget and time deadline difficult (Sweeney and Pierce, 2004). Auditing is labor intensive and auditors experience high time pressure on audits (Sweeney et al., 2010). Fung et al. (2012) have suggested that industry specialization enables auditors to audit a larger number of clients within an industry, which increases audit efficiency, because of the similar client characteristics. Industry specialist auditors are better able to understand their clients and more likely to update their knowledge than non-specialist auditors (Lim and Tan, 2010). Therefore, clients are less likely to impose time

pressure on industry specialist auditors, who complete the audit engagement more efficiently.

Audit clients keep imposing pressure on auditors to reduce hours required for the fiscal year-end audit (Behn et al., 2006). When a single client contributes a large portion of the auditor's total fees in an industry, the client is of more importance to the auditor (Casterella et al., 2004). Audit firms prefer to maintain long-standing auditor-client relationships with clients (Nagy, 2005). Casterella et al. (2004) found evidence that audit fee premiums exist only for small companies who have little bargaining power. Thus, large clients have strong bargaining power and avoid paying audit fee premiums, resulting in less time available for the audit engagement. Time pressure is expected to increase as the size of the client entity increases.

This paper investigates the time expectation gap and factors that affect time pressure in audit work, including auditors' specialization and the size of the client entity. If these two factors are the determinants of the time expectation gap, it would be feasible to control auditors' time pressure, improve their performance, and reduce their litigation risk.

As industry specialization improves auditors' work efficiency by reducing auditors' time used to understand clients' and industry-specific knowledge, it also helps reduce auditors' work time and thus helps to decrease the time pressure.

H1: When auditors are specialists (non-specialists) in their clients' industries, time pressure is reduced (increased).

### 3 The size of the client entity

Casterella et al. (2004) have examined clients' bargaining power relative to the size of the client. They found that audit fees were inversely proportional to the company size, and clients that generated higher revenue were more economically important to auditors and had more bargaining power to negotiate lower audit fees. Huang, Liu, Raghunandan, and Rama (2007) found a negative association between client bargaining power and audit fees. Huang et al. (2007) found that large companies avoided fee premiums for a high-quality audit service. However, as the audit fee is often based on reported audit hours, attaining more audit hours is considerably difficult (Gist and Davidson, 1999; Rahmat and Iskandar, 2004). Therefore, time budget pressure is expected to increase when the client is a large company.

Moreover, a negative relationship exists between the size of the client and the audit report lag (Behn et al., 2006; Krishnan and Yang 2009; Habib and Bhuiyan, 2011); the latter is defined as the period between a company's financial year-end and the audit report sign-off date; thus, a shorter audit report lag indicates a greater time deadline pressure (Bamber, Bamber, and Schoderbek, 1993). Large client companies face more public scrutiny from investment

analysts who rely on the financial reports for investment decision making, so they are able to impose more pressure on auditors for timely reporting compared to small client companies (Owusu-Ansah, 2000). Therefore, large client companies are expected to increase time deadline pressure.

H2: When the audit client is a small (large) client company, time pressure decreases (increases).

## 4 Research method

### 4.1 Research design

The study used experimental method to test the hypotheses. Participants were presented with materials describing the objectives of the study. They were required to record their perceptions based on their work experience. The participants were randomly assigned to various scenarios.

A 2×2 between-participants design was used to test the research hypotheses. The experiment comprised four different scenarios of the fiscal year-end audit, including a large client company with auditors specialized/not specialized in the industry and a small client company with auditors specialized/not specialized in the industry. Before commencement of the research, a pilot study was conducted among academic professors and auditors to check the instrument for realism and length. Some minor changes were made based on their feedback.

### 4.2 Measurement of independent variables

Industry specialization is determined based on the market share of an auditing firm in an industry, with the threshold of market share for an industry specialist audit firm being 20 percent or more (Jaggi, Gul, and Law, 2012). The mining and financial services industries were adopted in the experiment. In the mining industry scenario, the industry specialist audit firm audited 6 mining companies that had total assets accounting for 50 percent of assets of all companies in the mining industry. The audit fees earned from mining companies amounted to 33 percent of the total audit fees in the mining industry earned by all audit firms.

The client company size was measured based on the Australian Corporations Act (2001). In the experiment, a company with 20 employees, total assets of A\$11 million and revenue of A\$7 million for the financial year was considered a small company. A large company was one with 100,000 employees, and total assets of A\$980,000 million and annual revenue of A\$78,000 million.

Recently, sustainability information from management, such as carbon accounting has become more important, and the proposed carbon pricing mechanisms are likely to impose pressure on the mining industry (Pellegrino and Lodhia, 2012).

Because mining companies have to match their disclosure with societal expectations (Pellegrino and Lodhia, 2012), financial reports of mining companies tend to be more complicated, and audit procedures are expected to be more complex and time-consuming. Therefore, auditors in the mining industry are expected to experience time pressure. However, financial firms have relatively low levels of fixed assets and inventory, and their accounting systems involve daily financial statements, regular reports and strong internal control, due to supervisory authorities (Henderson and Kaplan, 2000).

#### 4.3 Measurement of dependent variables

Time budget pressure was measured in two ways; the first measure was budget attainability (Kelley and Margheim, 1990; Pierce and Sweeney 2004). Participating auditors indicated the adequacy of time budgets on a 5-point Likert scale, ranging from 1 “impossible to achieve” to 5 “very easy to attain” (Kelley and Margheim, 1990; Pierce and Sweeney, 2004). The second measure of time budget pressure was auditors’ self-perception of their competence to deal with time budget related pressure, measured on a 7-point Likert scale, ranging from 1 “not competent” to 7 “highly competent” (Kelley *et al.*, 1999). Time deadline pressure was determined by estimating the adequacy of time to finish the audit assignment, and competency to deal with time deadline related pressure.

#### 4.4 Data collection

The experiment began by contacting external auditors randomly from the membership list of the Institute of Chartered Accountants in Australia and the website of audit firms located in Sydney. Auditors from several firms participated in the study to reduce the effects of a firm’s specific training on their judgment (Braun, 2000). Each participating auditor was exposed to the fiscal year-end audit of a financial services company and a mining company, and was requested to answer questions regarding their perceptions of time pressure according to the two scenarios, as well as demographic and debriefing questions<sup>3</sup>. A total of 754 experiments were distributed via email, and 94 responses were received, among which six responses had missing data and 18 responses failed in manipulation. The response rate was approximately 12.5 percent, and there were 70 usable responses<sup>3</sup>.

### 5 Results

#### 5.1 Demographic information

Among the valid responses, 38 (54.3 percent) of the participants were male and 32 (45.7 percent) were female. Twenty-three (32.9 percent) of the

participants were junior auditors, 23 (32.9 percent) were senior auditors, 6 (8.6 percent) were audit managers, and 18 (25.7 percent) were audit partners. Prior research has indicated that a minimum of two years of audit experience was required in order to ensure that all participants had sufficient work experience to deal with the case materials (Moroney and Carey, 2011). In total, 70 auditors with an average 3.3 years of audit experience completed the two cases outlined above.

Age wise, 40 (57.1 percent) of the participants were aged under 30 years, 17 (24.3 percent) were aged between 30 and 40 years, 4 (5.7 percent) were aged between 41 and 50 years, and 9 (12.9 percent) were more than 50 years old.

#### 5.2 Manipulation check

Participants were asked to respond on a 7-point Likert-type scale from 1 “do not agree” to 7 “strongly agree” relating to the size of the client company and the audit firms’ specialization.

When the audit firm is an industry specialist, the level of agreement on whether the firm is specialized in the industry was higher ( $p < 0.01$ ). When the client is a large company, the level of agreement on whether the client is a large company was higher ( $p < 0.01$ ).

#### 5.3 The time pressure

Table 1 summarizes the mean and standard deviation for the time pressure (time budget pressure and time deadline pressure). The overall value of the time budget pressure in terms of achievability of time budgets was 3.01, indicating the auditors’ perceived time pressure during the fiscal year-end audit engagement. The estimated levels of the time budget achievability pressure were 3.04 in the mining industry and 2.97 in the financial services industry. The overall time budget pressure measured by achievability of time budgets without under-reporting of time (URT) was 2.93, for both mining and financial services industries.

The overall time deadline pressure measured by perception of adequacy of time was 3.09. The time deadline pressure was 3.17 in the mining industry and 3.00 in the financial services industry. The overall time deadline pressure measured by competence to deal with time deadline related pressure was 4.40 derived from 4.33 in the mining industry and 4.47 in the financial services industry. Table 2 presents the mean and standard deviation for the time pressure by conditions for, (1) specialized in the industry and client being a small/large company, and (2) not specialized in the industry and client being a small/large company. A higher score means a lower time pressure.

**Table 1.** Descriptive statistics for the time pressure

	<i>Mining industry</i>		<i>Financial services industry</i>		<i>Overall</i>	
	<i>Mean</i>	<i>Standard deviation</i>	<i>Mean</i>	<i>Standard deviation</i>	<i>Mean</i>	<i>Standard deviation</i>
1. In general, how would you assess the achievability of the time budgets for this client?	3.04	1.01	2.97	0.98	3.01	0.91
2. If you did not underreport any time spent on this client, would you meet time budget?	2.93	0.94	2.93	0.84	2.93	0.80
3. Do you believe you have adequate time to complete this audit assignment?	3.17	0.83	3.00	0.82	3.09	0.74
4. Would you feel competent to deal with any time budget related pressure for this client?	4.27	1.40	4.30	1.27	4.29	1.17
5. Would you feel competent to deal with time deadline related pressure?	4.33	1.29	4.47	1.24	4.40	1.14

Table 2 indicates that the overall level of the time budget pressure, measured by achievability of time budget, was mainly lower for auditors who were industry specialists (Mean = 3.37 vs. Mean = 2.72) and where the client was a small company (Mean = 3.05 vs. Mean = 2.97). The time budget pressure measured by achieving time budget without URT was also lower when auditors were specialized in the industry (Mean = 3.26 vs. Mean = 2.63) and the client was a small company (Mean = 3.12 vs. Mean = 2.68). The overall time budget pressure measured by competence to deal with time budget related pressure was lower when auditors were specialized in the industry (Mean = 4.81 vs. Mean = 3.87) and the client was a small company (Mean = 4.39 vs. Mean = 4.19). The time deadline pressure in terms of perceived adequacy of audit time was lower when auditors were industry specialists (Mean = 3.37 vs. Mean = 2.86) and the client was a small company (Mean = 3.17 vs. Mean = 3.01). The overall time deadline pressure measured by competence to deal with this pressure was lower when auditors were industry specialists (Mean = 4.85 vs. Mean = 4.05) and the client was a small company (Mean = 4.48 vs. Mean = 4.34).

## 6 Hypothesis Tests

Two hypotheses were developed in this paper concerning whether the time pressure was affected by: (1) specialization of the audit firm, and (2) the size of the client company. ANOVA was used to test hypotheses 1 and 2.

### 6.1 Hypothesis 1

Hypothesis 1 states that the level of time pressure is lower when the auditors are industry specialists, and

that time pressure increases when auditors are not specialized in the industry.

Table 3 summarizes the results of the ANOVAs for all the dependent variables. The table indicates a significant relationship between industry specialization of the auditor and the time budget pressure measured by achievability of time budgets in both mining ( $F = 5.45$ ,  $p = 0.02$ ) and financial services ( $F = 11.09$ , ( $p < 0.01$ )) industries. There is also a significant relationship between the industry specialization of auditors and the time budget pressure measured by achievability of time budgets without URT in both mining ( $F = 12.99$ , ( $p < 0.01$ )) and financial services ( $F = 4.94$ ,  $p = 0.03$ ) industries. A significant relationship exists between industry specialization of auditors and the time budget pressure measured by competence to deal with time budget pressure in both the mining ( $F = 5.73$ ,  $p = 0.02$ ) and financial services ( $F = 14.23$ , ( $p < 0.01$ )) industries.

The industry specialization of auditors was also significantly related to the time deadline pressure measured by the perceived adequacy of time to complete the audit assignment in both the mining ( $F = 6.55$ ,  $p = 0.01$ ) and financial services ( $F = 7.73$ ,  $p = 0.01$ ) industries. There was also a significant relationship between industry specialization and the time deadline pressure measured by competence to deal with this pressure in both the mining ( $F = 4.58$ ,  $p = 0.04$ ) and financial services ( $F = 12.78$ , ( $p < 0.01$ )) industries.

**Table 2.** Descriptive statistics

<i>Industry specialisation</i>	<i>Size</i>	<i>Mean</i>	<i>Std. deviation</i>	<i>Mean</i>	<i>Std. deviation</i>	<i>Mean</i>	<i>Std. deviation</i>
Q1. In general, how would you assess the achievability of the time budgets for this client? (Time Budget Pressure1) Based on the 5-point scale.							
		<i>Mining industry</i>		<i>Financial services industry</i>		<i>Overall</i>	
<b>Specialized</b>	Large client	3.27	0.88	3.47	0.92	3.37	0.77
	Small client	3.44	1.15	3.31	0.87	3.38	0.92
	Total	3.35	1.02	3.39	0.88	3.37	0.84
<b>Non-specialized</b>	Large client	2.82	1.00	2.59	0.91	2.70	0.85
	Small client	2.76	0.90	2.71	0.99	2.74	0.92
	Total	2.79	0.95	2.64	0.93	2.72	0.87
<b>Total</b>	Large client	3.00	0.97	2.95	1.00	2.97	0.87
	Small client	3.09	1.07	3.00	0.97	3.05	0.96
	Total	3.04	1.01	2.97	0.98	3.01	0.91
Q2. If you did not underreport any time spent on this client, would you meet the time budgets? (Time Budget Pressure 2) Based on the 5-point scale.							
	<i>Time deadline pressure</i>	<i>Mining industry</i>		<i>Financial services industry</i>		<i>Overall</i>	
<b>Specialized</b>	Large client	3.07	0.88	3.00	0.85	3.03	0.79
	Small client	3.62	1.03	3.31	0.87	3.47	0.83
	Total	3.35	0.99	3.16	0.86	3.26	0.83
<b>Non-specialized</b>	Large client	2.45	0.80	2.41	0.80	2.43	0.68
	Small client	2.76	0.66	3.00	0.87	2.88	0.70
	Total	2.59	0.75	2.67	0.87	2.63	0.71
<b>Total</b>	Large client	2.70	0.88	2.65	0.86	2.68	0.77
	Small client	3.18	0.95	3.15	0.87	3.12	0.81
	Total	2.93	0.94	2.89	0.90	2.91	0.82
Q3. Do you believe you have adequate time to complete this audit assignment? (Time deadline pressure 1) Based on the 5-point scale.							
	<i>Time deadline pressure</i>	<i>Mining industry</i>		<i>Financial services industry</i>		<i>Overall</i>	
<b>Specialized</b>	Large client	3.33	0.90	3.07	0.704	3.20	0.73
	Small client	3.56	0.73	3.50	0.73	3.53	0.62
	Total	3.45	0.81	3.29	0.74	3.37	0.68
<b>Non-specialized</b>	Large client	2.95	0.84	2.82	0.91	2.89	0.79
	Small client	2.94	0.75	2.71	0.69	2.82	0.64
	Total	2.95	0.79	2.77	0.81	2.86	0.72
<b>Total</b>	Large client	3.11	0.88	2.92	0.83	3.01	0.77
	Small client	3.24	0.79	3.09	0.81	3.17	0.71
	Total	3.17	0.83	3.00	0.82	3.09	0.74

**Table 2.** Descriptive statistics (continued)

<i>Industry specialisation</i>	<i>Size</i>	<i>Mean</i>	<i>Std. deviation</i>	<i>Mean</i>	<i>Std. deviation</i>	<i>Mean</i>	<i>Std. deviation</i>
Q4. Would you feel competent to deal with any time budget related pressure for this client? (Time Budget Pressure 3) Based on the 7-point scale.							
<i>Time deadline pressure</i>		<i>Mining industry</i>		<i>Financial services industry</i>		<i>Overall</i>	
<b>Specialized</b>	Large client	4.53	1.60	4.93	1.28	4.73	1.18
	Small client	4.87	1.09	4.88	0.96	4.88	0.96
	Total	4.71	1.35	4.90	1.11	4.81	1.05
<b>Non-specialized</b>	Large client	4.00	1.38	3.64	1.18	3.82	1.08
	Small client	3.82	1.38	4.06	1.20	3.94	1.16
	Total	3.92	1.37	3.82	1.19	3.87	1.10
<b>Total</b>	Large client	4.22	1.48	4.16	1.37	4.19	1.19
	Small client	4.33	1.34	4.45	1.15	4.39	1.15
	Total	4.27	1.40	4.30	1.27	4.29	1.17
Q5. Would you feel competent to deal with time deadline related pressure? (Time Deadline Pressure 2) Based on the 7-point scale.							
<i>Time deadline pressure</i>		<i>Mining industry</i>		<i>Financial services industry</i>		<i>Overall</i>	
<b>Specialized</b>	Large client	4.67	1.18	5.00	1.20	4.80	1.07
	Small client	4.75	1.18	5.06	1.06	4.91	1.08
	Total	4.71	1.16	5.03	1.11	4.85	1.06
<b>Non-specialized</b>	Large client	4.05	1.29	3.95	1.17	4.02	1.13
	Small client	4.06	1.39	4.12	1.17	4.09	1.18
	Total	4.05	1.32	4.03	1.16	4.05	1.13
<b>Total</b>	Large client	4.30	1.27	4.38	1.28	4.34	1.16
	Small client	4.39	1.32	4.58	1.20	4.48	1.19
	Total	4.34	1.28	4.47	1.24	4.41	1.16

The results of post hoc tests indicated that the time budget pressure measured by achievability of time budgets was significantly reduced when auditors were industry specialists in the mining industry (Mean = 3.35 vs. Mean = 2.79) and in the financial services industry (Mean = 3.39 vs. Mean = 2.64). The time budget pressure measured by achievability of time budgets without URT also decreased for industry specialist auditors in the mining (Mean = 3.35 vs. Mean = 2.59) and financial services (Mean = 3.16 vs. Mean = 2.67) industries.

The time budget pressure measured as competence to deal with time budget related pressure was reduced for industry specialist auditors in the mining (Mean = 4.71 vs. Mean = 3.92) and financial services (Mean = 4.90 vs. Mean = 3.82) industries. Moreover, the time deadline pressure measured as perceived adequacy of audit time was also lower for industry specialist auditors in the mining (Mean = 3.45 vs. Mean = 2.95) and the financial services (Mean = 3.29 vs. Mean = 2.77) industries. The time

deadline pressure measured by competence to deal with this pressure decreased in the mining (Mean = 4.71 vs. Mean = 4.05) and financial services (Mean = 5.03 vs. Mean = 4.03) industries. The results support Hypothesis 1.

This result supports a prior finding (e.g., Krishnan, 2003, p. 110) that specialized auditors are “more likely to deter and detect questionable accounting practices and report material errors and irregularities than are low-quality auditors. Because high-quality auditors have the expertise, resources, and incentive to separate the information component from noise”.

## 6.2 Hypothesis 2

Hypothesis 2 states that time pressure decreases when the audit client is a small company and increases when the audit client is a large company. A difference in the size of client companies is expected to result in variations in levels of time pressure.

**Table 3.** Summary of ANOVA tests

Source	SS	df	MS	F	Sig.	SS	df	MS	F	Sig.
Q1. In general, how would you assess the achievability of the time budgets for this client? (Time Budget Pressure1)										
	<i>Mining industry</i>					<i>Financial services industry</i>				
Specialization	5.39	1	5.39	5.45	0.02	9.41	1	9.413	11.09	0.00
Size	0.06	1	0.06	0.06	0.81	0.01	1	0.007	0.01	0.93
Specialization size *	0.22	1	0.22	0.22	0.64	0.31	1	0.31	0.37	0.55
Error	65.20	66	0.988			56.02	66	0.85		
Total	719.00	70				684.00	70			
Corrected Total	70.87	69				65.94	69			
	R Squared = 0.08 (Adjusted R Squared= 0.05)					R Squared = 0.151 (Adjusted R Squared = 0.112)				
Q2. If you did not underreport any time spent on this client, would you meet the time budgets? (Time Budget Pressure 2)										
Pressure	<i>Mining industry</i>					<i>Financial Services industry</i>				
Specialization	9.29	1	9.29	12.99	0.00	3.50	1	3.50	4.94	0.03
Size	3.23	1	3.23	4.52	0.04	3.50	1	3.50	4.94	0.03
Specialization size *	0.26	1	0.26	0.37	0.55	0.33	1	0.33	0.47	0.50
Error	47.20	66	0.72			46.76	66	0.71		
Total	661.00	70				638.00	70			
Corrected Total	60.64	69				55.09	69			
	R Squared = 0.222 (Adjusted R Squared = 0.186)					R Squared = 0.118 (Adjusted R Squared = 0.078)				
Q3. Do you believe you have adequate time to complete this audit assignment? (Time deadline pressure 1)										
	<i>Mining industry</i>					<i>Financial services industry</i>				
Specialization	4.29	1	4.29	6.55	0.01	4.66	1	4.66	7.73	0.01
Size	0.20	1	0.20	0.31	0.58	0.44	1	0.44	0.73	0.40
Specialization size *	0.25	1	0.25	0.39	0.54	1.28	1	1.28	2.12	0.15
Error	43.17	66	0.65			39.74	66	0.60		
Total	752.00	70				676.00	70			
Corrected Total	47.94	69				46.00	69			
	R Squared = 0.100 (Adjusted R Squared = 0.059)					R Squared = 0.136 (Adjusted R Squared = 0.097)				
Q4. Would you feel competent to deal with any time budget related pressure for this client? (Time Budget Pressure 3)										
<i>Time deadline Pressure</i>	<i>Mining industry</i>					<i>Financial services industry</i>				
Specialization	10.76	1	10.76	5.73	0.02	19.13	1	19.13	14.23	0.00
Size	0.12	1	0.12	0.06	0.80	0.57	1	0.57	0.42	0.52
Specialization size *	1.15	1	1.15	0.612	0.44	0.99	1	0.99	0.74	0.39
Error	123.95	66	1.88			88.72	66	1.34		
Total	1413.00	70				1405.00	70			
Corrected Total	135.84	69				110.70	69			
	R Squared = 0.09 (Adjusted R Squared = 0.05)					R Squared = 0.20 (Adjusted R Squared = 0.16)				

**Table 3.** Summary of ANOVA tests (continued)

Source	SS	df	MS	F	Sig.	SS	df	MS	F	Sig.
Q5. Would you feel competent to deal with time deadline related pressure? (Time Deadline Pressure 2)										
	<i>Mining industry</i>					<i>Financial services industry</i>				
Specialization	7.38	1	7.38	4.58	0.04	16.97	1	16.97	12.78	0.00
Size	0.04	1	0.04	0.03	0.88	0.22	1	0.22	0.16	0.69
Specialization * size	0.02	1	0.02	0.01	0.91	0.04	1	0.04	0.03	0.86
Error	106.23	66	1.61			87.66	66	1.328		
Total	1434.00	70				1505.00	70			
Corrected Total	113.77	69				105.44	69			
	R Squared = 0.06 (Adjusted R Squared = 0.02)					R Squared = 0.17 (Adjusted R Squared = 0.13)				

Table 3 reports no significant relationship between time budget pressure, measured by achievability of time budgets, and the size of audit clients in the mining ( $F = 0.06$ ,  $p = 0.81$ ) or financial services ( $F = 0.01$ ,  $p = 0.93$ ) industries. There is a significant relationship between time budget pressure, measured by the achievability of time budgets without URT, and the size of audit clients in the mining ( $F = 4.52$ ,  $p = 0.04$ ) and financial services ( $F = 4.94$ ,  $p = 0.03$ ) industries. The size of the clients is not significantly related to the time budget pressure, measured by competence to deal with time budget related pressure, in the mining ( $F = 0.06$ ,  $p = 0.80$ ) and financial services industries ( $F = 0.42$ ,  $p = 0.52$ ).

Table 3 also indicates that there is no support for Hypothesis 2. The possible explanation for the results is that the size of the client company may affect auditors' work efficiency and audit timeliness

## 7 Conclusions

The purpose of this paper was to examine the impact of industry specialization and the size of the client company on time pressure. The results show that time pressure depends on whether the auditor is specialized or not. This paper found that there was a significant difference in the time pressure between industry specialist auditors and non-specialist auditors. The results support a prior study that industry specialization improves the efficiency of audit performance (Fung *et al.*, 2012). Industry specialist auditors are able to better understand the issues within the industry and efficiently attain an understanding of the problems at hand, so they spend less time searching for and reading information regarding the client's industry (Moroney, 2007). Therefore, time pressure is less in the case of specialized auditors.

It is important for audit firms to invest in personnel and capital resources to develop industry-specific knowledge in their firms, in order to reduce

time pressure and improve efficiency of the audit engagement and enhance audit quality. Audit partners may put more emphasis on developing and teaching industry-specific technology among auditors via various training programs. Auditors can gain knowledge from in-house courses, examination-based learning, practical application (Marriott, Telford, Davies, and Evans, 2011) and industry-specific knowledge databases. Performance of additional services, such as non-audit services, also enrich auditors' knowledge concerning their clients and their various industries (Beck and Wu, 2006). The size of the client company does not significantly influence time pressure.

This paper has several limitations. It used experimental results to examine time pressure. This method is acknowledged as having a lack of realism (Barabas and Jerit, 2010). Another limitation of the experiment is the treatment spill-over effect (Gaines, Kuklinski, and Quirk, 2007). Experiments usually have participants exposed to different scenarios, and participants are asked questions that serve as the dependent variable in one scenario, and then the process repeats in a new scenario (Transue, Lee, and Aldrich, 2009). Instead of viewing each scenario as a new topic, participants may process later scenarios in terms of their relevance to the first scenario (Transue *et al.*, 2009). It is possible that the latter scenario inherits its prior treatment effects (Gaines *et al.*, 2007). In this paper, each participant dealt with two scenarios in each of the mining and financial services industries, where responses to the second scenario tended to be affected by the first one.

This paper has concentrated on specialization within an audit firm. Issues related to whether the time pressure is affected by individual partner specialization have not been examined. These results have significant implications for audit firms, audit committees and regulators. As auditing firms and audit committees are under increasing pressure to

complete audits in a shorter time, they must understand the risks of time pressure. For example, audit failures may occur because of time pressure (Ernst and Young, 2011). Also, regulators should be aware of the negative impact of regulation that increases time pressure on auditing firms.

## Note

1. Industry specialization at the firm level rather than at the individual level was examined.

2. The order of the financial services and mining industries was not counter balanced.

3. All the tests were performed on the entire sample including the excluded individuals. The tests showed no significant differences between the full sample and the used sample.

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