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A longitudinal study of audit quality differences among independent auditors

Manh Dung Tran
National Economics University, Hanoi, Vietnam
Khairil Faizal Khairi
University Sains Islam, Bandar Baru Nilai, Malaysia, and
Nur Hidayah Laili
University Sains Islam, Kuala Lumpur, Malaysia

Abstract

Purpose – The purpose of this paper is to investigate the differences of audit quality of financial statements among auditors, including Big 4 and non-Big 4 auditors.
Design/methodology/approach – By employing cross-sectional analysis of compliance (a proxy of audit quality) of goodwill impairment testing of listed firms in the context of Hong Kong, the variation of audit quality of financial statements of auditees has been shown.
Findings – Audit quality of Big 4 auditors is viewed to be higher than that of non-Big 4 audit firms and the homogeneity of audit quality among Big 4 auditors is not long accepted, but variation.
Practical implications – Even though unqualified opinions have been given on the auditors' reports, the quality of financial statements audit is a skeptical issue because of the high level of non-compliance of goodwill impairment testing under International Financial Reporting Standards.
Originality/value – This study does emphasize the higher audit quality of financial statements of Big 4 auditors than that of non-Big 4 auditors and stresses the variation of audit quality among Big 4 auditors.

Keywords Hong Kong, Goodwill, Audit quality, HKAS 36

Paper type Research paper

1. Introduction

Audit quality is viewed as one of the most important issues in the audit activities (Kit, 2005) and is defined as probability that financial statements are fairly presented when an unqualified opinion is given (Simunic, 2003). The acceptance of big audit firm associated with high audit quality for a long passage of time is given in a huge literature (DeAngelo, 1981; Balvers *et al.*, 1988; Firth and Smith, 1992; Copley *et al.*, 1994). However, that acceptance is undermined by bankruptcy of some auditees and auditors as well.

In order to have a high audit quality, material misstatements should be detected basing on technical competence and reported basing on independence of an auditor. In other words, high audit quality relates to high information quality of financial reporting since financial statements audited by high-quality auditors should be less likely to contain material distortions (Dang, 2004).

Currently, about 140 countries, including Hong Kong, switched to International Financial Reporting Standards (IFRS)-based financial reporting framework. The adoption of IFRS views is the most revolutionary financial reporting development and makes very difficult for financial statement practitioners including accountants and auditors as well.

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For the convergence of IFRS, Hong Kong has set up an own accounting framework, Hong Kong Financial Reporting Standards (HKFRS), that came into effect from January 1, 2005. Because of over-complexity and challenged requirements in HKFRS, there is a high possibility to have potentials misstatements in the financial statements of listed firms in the early years after HKFRS implementation. This also makes more difficult for an auditor to detect misstatements in an audittee's accounting system. So audit quality may be influenced in these circumstances.

Impairment of assets including goodwill impairment and its disclosure is viewed as one of the most complicated issues in practices (Hoogendoorn, 2006). Forming financial statements complying with the requirements of HKAS 36 "Impairment of Assets" or IAS 36 equivalent requires listed firms to employ some financial principles drawn from discounting, forecasting and valuation models under potentially uncertain situations. With different subjective assumptions relating to discount rates, growth rates and forecast periods result in outcomes of present values that are discounted from future cash flows and to evaluate which the best outcome is too difficult and have potential controversy.

Because assurance of an audit (audit quality) is likely to be positively associated with compliance with standards (Copley *et al.*, 1994), changes in disclosure of goodwill impairment in the note to financial statements are likely to be the result of variations in audit quality. So measurement of audit quality variations employed in this study is the extent of compliance changes with the disclosure requirements of HKAS 36 in the data set of time series. So the level of technical compliance with requirements of disclosures considers as a surrogate for audit quality in relation to challenged and over-complicated items of the goodwill impairment testing framework.

This study is structured as follows. Section 2 reviews the suitable literature of audit quality. Section 3 describes the data sample collection and methodology employed in the conduct of the research. Section 4 sets out a discussion of key results, while Section 5 shows some key conclusions and implications of the study practice and potential further research.

2. Literature review

Audit quality is defined as the probability that an auditor detects and reports material misstatements in the accounting system of an auditee (DeAngelo, 1981). It means that audit quality is stated as probability that financial statements are free from material misstatements (Palmrose, 1988). In that perception, audit quality includes two elements: the first is generally explained to be related to the technical competence, and the second bears on independence of an auditor (Caneghem, 2004).

However, the quality of an audit is not public information and cannot be directly observed by financial statement users. So, evaluating audit quality is one of the most controversial issues nowadays. Auditor size is by far one of the most frequently employed as a proxy for audit quality in previous studies. DeAngelo (1981) demonstrates that larger audit firms have more clients, more reputations and more to lose by failing to report discovered misstatements in the financial statements than smaller audit firms have. So this motivates big audit firms to work harder than non-big audit firms, and, *ceteris paribus*, more efforts imply higher audit quality. DeF and Jiambalvo (1991) found that larger audit firms incur costs to develop a reputation for adding value to the audit and are better able to detect and inform material misstatements in the financial statements.

A series of empirical evidence is ostensibly consistent with the hypothesis that big auditors provide higher audit quality than small ones. Moize (1997) suggests that big firms' audit fees are higher than non-big firms' audit fees. The reason is that higher audit fee is related with a greater number of hours and hence a higher reputation implies a higher audit quality. Becker *et al.* (1998) show that discretionary accruals of auditees with non-big auditors are higher than that of clients with big auditors, meaning that higher audit quality is more likely to successfully detect and prevent earnings management of audfitees.

Big audit firms have been found to have lower litigation occurrence rates than non-big audit firms (Palmrose, 1988). Krishnan and Schauer (2000) conclude that the compliance of Generally Accepted Accounting Principles (GAAP) reporting requirements of big audit firm clients are higher than that of non-big audit firm clients and assume that extent of compliance with GAAP is likely to be related to the probability of detecting and revealing material misstatements.

There are more and more other huge literature also provide much empirical evidence for asserting that auditor size is a proxy for audit quality. However, events of the bankruptcies of many clients such as WorldCom and auditors as well as such as Arthur Anderson have both reduced the good image of audit industry.

A small number of recent studies have begun to examine the possibility of differential audit quality among large audit firms, rather than assuming that there is a homogeneous audit quality among large audit firms. Fuerman (2004) looks into the possibility of audit quality differentials among large audit firms by examining financial disclosures relating to private securities class actions from 1996 to 1998 and finds that Arthur Andersen produced audits of lower quality compared against the remainder of the Big 6 auditors, but distinguishing audit quality among these audit firms was impossible. In contrast, Eisenberg and Macey (2003) analyze the financial restatements performed by auditors and find no evidence of audit quality differentials among large audit firms, including Arthur Andersen.

While audit quality literature is propensity to support the idea that audit quality undertaken by large auditors outweighs that undertaken by small auditors, there is little evidence to reveal audit quality change among big auditors. Because aspects of the probability to discovering and reporting material misstatements are unobservable (Krishnan and Schauer, 2000), so researchers have selected two approaches for evaluating audit quality in empirical work, namely, indirect and direct methods. The evaluation of audit quality on an indirect method tends to stem from a process of comparing observed values for some accepted surrogates for quality among audit firms, while attempts to measure direct audit quality through the process of the audit.

As analyzed above, the issue of audit quality variations among big audit firms as well as big audit firms vs non-big audit firms reveals very importance and needs to be investigated. Further, in countries where the adoption of the IFRS-based reporting framework has coincided with other types of structural shifts influencing much on audit services, significant emphasis has been directed toward auditors (Carlin *et al.*, 2009). So the implementation of IFRS represents a good point to be scrutinized including the issue of goodwill impairment testing regime.

Measuring and reporting goodwill based on the IFRS framework produce significant challenges to Hong Kong listed firms. Almost all listed firms will be influenced by the more highly prescriptive impairment test under HKAS 36. With over-complex and challenged requirements, issues of identifying, measuring and reporting goodwill and its impairment are really difficult for listed firms to use. Under HKAS 36, listed firms are supposed to deal with considerably expanded disclosure requirements in particular bearing on to method employed for measuring the cash generating unit (CGU) recoverable amount, impairment testing regime, including disclosures relating to key subjective assumptions.

Value of goodwill is impaired in case recoverable amount of portfolios of assets (known as CGUs) lowers than carrying amount (book value) related to those assets. Recoverable amount is defined as the higher of an asset's or a CGU's fair value less costs of disposal and its value in use. It turns out that listed firms are required to select either a fair value or value in use for estimating CGU-recoverable amount, and each method produces considerable implications for the types of disclosures provided by listed firms.

HKAS 36 requires limited disclosures of the assumptions and processes adopted by a firm which has chosen fair value as the benchmark for impairment testing, whereas more

specific and highly detailed disclosures are required listed firms to report when employing value in use for determination of CGU recoverable amount.

The adoption of goodwill impairment has not produced significant changes to the format and nature of information on the face of financial position statement and comprehensive income statement; it has considerably changed to disclose information relating to goodwill in the notes to the consolidated financial statements. These changes would have been revealed in the accounting policies and specific notes for justifying the value of goodwill in the financial position statement.

From an audit perspective, the IFRS framework results in overwhelming increases in disclosures, and requires more involvement of auditors in achieving full compliance with IFRS. Apparently, volume of audit work increases significantly due to complicated provisions in IFRS as well as overwhelming information disclosures in the notes to the financial statements.

Shifting to an IFRS-based regime for goodwill impairment has a big impact on disclosures in the notes to the financial reports. The highly detailed disclosure requirements in HKAS 36 represent a good opportunity to look into the compliance levels that were undertaken by listed firms, and provide insights of audit quality differentials among auditors. Since goodwill impairment testing is the one used to identify misstatements in the accounting system of an auditee, the extent of compliance is likely to be directly correlated with the probability of discovering and reporting material misstatements in the accounting system, or audit quality.

3. Research methodology

The study consists of the first three years of financial reporting pursuant to HKAS 36 in Hong Kong. The Worldscope Datastream database was used to identify the population of firms listed on the Hong Kong Stock Exchange (HKEx) in the first three years adoption of HKFRS.

In constructing the final research sample, a number of steps were undertaken. First, firms are required to be the members in main board of HKEx as at December each year. Second, commence with the largest of these firms (based on the market capitalization) and move to each smaller company. Third, choose listed firms which have goodwill balances as their asset bases in the consolidated financial statements and applied HKFRS in each year.

As a result, there are 161 listed firms with market value of $4,431bn in the first time (accounting for 54.61 percent in total market values), 249 with market capitalization of $8,349bn (about 63.02 percent) in the second time and 264 with market values of $12,922bn (about 62.93 percent) in the third time.

Table I shows the number of firms audited by auditors, and by industry sectors in the multi-year data set. There was no evidence in the multi-year data set of significant variations pertaining to the number of firms audited by auditors. The number of clients for each auditor in the multi-year data set is uneven, with PricewaterhouseCoopers (PWC) dominating in the each year sample, followed by Deloitte, Ernst and Young (EY), and KPMG, and other auditors (or non-Big 4 auditors) with minimal share in the research sample.

A crucial issue is the extent to which auditees comply with over complex technical provisions of a new and challenged standard. Potential interests of CGU issue, discount rate and growth rate disclosures should be investigated under HKAS 36. A cross-sectional procedure were applied to the sample data.

First, sample firms were sorted by audit firm identity, according to whether they employed a value in use method to estimation of CGU recoverable amount, a fair value less costs of disposal method, a combination of methods (*i.e.* the use of value in use in some CGUs and use of fair value in others), or failed to disclose the method used.

Table I.
Number of firms audited by sectors

	No. of firms									
					Deloitte			EY		
Sectors	1st time	2nd time	3rd time	1st time	2nd time	3rd time	1st time	2nd time	3rd time	
Consumer goods and conglomerate	48	73	77	13	22	16	13	18	21	
Financials	16	24	25	3	6	5	3	7	7	
Telecommunication and services	47	69	62	8	11	13	9	10	10	
Materials and industrial goods	20	29	37	9	11	11	3	7	8	
Utilities, energy and construction	30	54	63	10	17	18	5	9	12	
Total (*n*)	161	249	264	43	67	63	33	51	58	
Percentages in each year (%)	100	100	100	26.7	26.9	23.9	20.5	20.5	22.0	
		KPMG			PWC			Non-Big 4		
Sectors	1st time	2nd time	3rd time	1st time	2nd time	3rd time	1st time	2nd time	3rd time	
Consumer goods and conglomerate	3	5	4	13	17	21	6	11	15	
Financials	6	8	9	4	3	4	0	0	0	
Telecommunication and services	5	7	6	23	30	24	2	11	9	
Materials and industrial goods	2	4	7	5	5	6	1	2	5	
Utilities, energy and construction	2	7	4	11	17	21	2	4	8	
Total (*n*)	18	31	30	56	72	76	11	28	37	
Percentages in each year (%)	11.2	12.5	11.4	34.8	28.9	28.8	6.8	11.2	14.0	

Second, the firms in the research sample were classified by audit firm identity, according to whether they allocated all goodwill values to the defined CGUs, or whether they allocated partially goodwill values to CGUs, or whether their disclosures were not given so it was impossible to determine how or if value of goodwill had been allocated to defined CGUs.

Third, the sample firms were filtered by audit firm, according to the relationship between the number of CGUs defined for the purpose of goodwill impairment testing and the number of operating segments for the purpose of segment information reporting.

Fourth, the sample firms were sorted by audit firm, according to the quality of discount rate disclosure in the goodwill impairment testing process. Data were stratified into four categories, namely, multiple discount rates, single discount rate, range of discount rates and no effective disclosure:

(1) Firms categorized in the first category, i.e. "multiple discount rate," appeared to fully comply with the disclosure requirements of HKAS 36 by disclosing unique rates applicable to each of their various CGUs. This type of disclosure fully complies with the standard requirements and provides a higher assurance of process quality through different discount rates to each defined CGU.

(2) Firms in the second category, i.e. "single discount rate," revealed that they defined blanket whole of company discount rate for all defined CGUs for estimating CGU recoverable amount in the discounted cash flow model. This did not appear to align with the requirements that a discount rate unique to each defined CGU and each CGU risk was arguably different.

(3) Firms were assigned in the third category disclosed a range of discount rates which had been employed for estimating the CGU recoverable amount in the discounted cash flow model. Because of lacking a specific discount rate to each defined CGU, it is questionable whether disclosure of this category meets the requirements of HKAS 36.

(4) Allocation of firms in the fourth category signified that the firms failed to provide inadequate discount rate disclosure and, in consequence, provided no meaningful information for financial statement users to evaluate the robustness of goodwill impairment testing process. Therefore, these firms were judged to have poor disclosures and not to comply with the disclosure requirements of HKAS 36.

(5) The sample firms were filtered by audit firm identity, according to the quality of growth rate disclosure. Data was stratified according to a very similar taxonomy to that described pertaining to discount rates, i.e. multiple growth rates, single growth rate, range of growth rates and no effective disclosure. The first category represented the highest level of disclosure, and the fourth the poorest.

4. Results and discussion

The interest of this research focuses on audit quality variations among auditors based on the listed firms' compliance with disclosure requirements relating to goodwill impairment under HKAS 36. The first question in understanding the process of goodwill impairment testing is the selection of valuation approach for estimating recoverable amount of assets assigned to CGUs.

Under HKAS 36, the recoverable amount of an asset or a CGU is the greater of its fair value less costs to sell, determined basing on market-based evidence, and its value in use, determined basing on a discounted cash flow model.

Table II shows the frequency of method used for estimating recoverable amount of an asset or a CGU, either fair value or value in use or mixed method (combination of the fair value and value in use), and no effective disclosure in the multi-year data set.

Sectors	Deloitte 1st time	Deloitte 2nd time	Deloitte 3rd time	EY 1st time	EY 2nd time	EY 3rd time	KPMG 1st time	KPMG 2nd time	KPMG 3rd time
Fair value	–	1	2	1	2	1	2	2	3
Value in use	42	58	58	27	42	52	12	28	26
Mixed method	–	3	2	4	2	1	–	–	–
No effective disclosure	1	5	1	1	5	4	4	1	1
Total (*n*)	43	67	63	33	51	58	18	31	30
Proportions of firms where no effective disclosure (%)	2.3	7.5	1.6	3.0	9.8	6.9	22.2	3.2	3.3

Sectors	PWC 1st time	PWC 2nd time	PWC 3rd time	Non-Big 4 1st time	Non-Big 4 2nd time	Non-Big 4 3rd time	Total 1st time	Total 2nd time	Total 3rd time
Fair value	–	–	1	–	1	1	3	6	8
Value in use	43	61	64	8	24	34	132	213	234
Mixed method	1	5	4	–	–	–	5	10	7
No effective disclosure	12	6	7	3	3	2	21	20	15
Total (*n*)	56	72	76	11	28	37	161	249	264
Proportions of firms where no effective disclosure (%)	21.4	8.3	9.2	27.3	10.7	5.4	13.0	8.0	5.7

Table II.
Methods employed to determine recoverable amount of CGUs

There was little evidence of a substantial variation of using a fair value or value in use approaches among clients of audit firms in the multi-year data set. Consistent with extant literature, the approach of value in use dominated in the initial IFRS adoption year and continued to dominate thereafter in the gradually increasing tendency. On the contrary, the fair value was applied by the small number of audit firm clients in the multi-year data set in the slightly increasing change. A small proportion of audit firm clients applied mixed method, combination of the fair value and value in use approaches, except clients of KPMG and other auditors.

A slightly falling tendency belongs to audit firm clients that failed to disclose method used for determining CGU recoverable amount. These clients were judged not to comply with disclosure requirements of HKAS 36. As a result, impairment testing process was impossible to be conducted.

Specifically, the non-compliant rates of not disclosing method used for calculating CGU recoverable amount belonging to clients of Deloitte, EY, PWC were in the fluctuation manners, whereas the non-compliance levels of not disclosing method belonging to clients of other audit firms and KPMG were in the decreasing tendency, in general. From this analysis, it appeared that clients of other auditors have higher levels of non-compliance with disclosure requirements in comparison with clients of Big 4 auditors, especially Deloitte.

The next analytical procedure employed was to compare the reported value of goodwill on the consolidated financial statements with the sum of the amounts of goodwill allocated to defined CGUs of reporting sample firms of audit firms. As set out in Table III, there was evidence of insignificant variations of using methods among audit firm clients in the multi-year data set.

The majority of firms fully complied with the disclosure requirements in the increasing manner, from 64 percent of total year sample in the first-year adoption, to about 72 percent in the second time, and 75 percent in the third time (in case it was possible to have matched data between value of goodwill on the balance sheet and the sum of goodwill allocated to CGUs). Only some cases belonging to clients of Deloitte, EY and KPMG that goodwill value allocated partially to defined CGUs and discrepancies between goodwill value and the sum of goodwill allocated to CGU were considered to be immaterial.

Meanwhile, a high proportion of audit firm clients provided no information bearing on the relationship between goodwill values and value of goodwill allocated to defined CGUs.

Sectors	Deloitte 1st time	Deloitte 2nd time	Deloitte 3rd time	EY 1st time	EY 2nd time	EY 3rd time	KPMG 1st time	KPMG 2nd time	KPMG 3rd time
Fully compliant	37	57	56	18	34	38	10	22	22
Ostensibly compliant	–	–	1	1	1	1	–	1	1
Non-compliant	6	10	6	14	16	19	8	8	7
Proportions of firms where no compliant (%)	14.0	14.9	9.5	42.4	31.4	32.8	44.4	25.8	23.3

Sectors	PWC 1st time	PWC 2nd time	PWC 3rd time	Non-Big 4 1st time	Non-Big 4 2nd time	Non-Big 4 3rd time	Total 1st time	Total 2nd time	Total 3rd time
Fully compliant	32	45	56	6	21	26	103	179	198
Ostensibly compliant	–	–	–	–	–	–	1	2	3
Non-compliant	24	27	20	5	7	11	57	68	63
Proportions of firms where no compliant (%)	42.9	37.5	26.3	45.5	25.0	29.7	35.4	27.3	23.9

Table III. CGU allocation compliance by auditors

On the whole sample, proportions of clients where non-compliance with disclosure requirements were in the decreasing tendency, i.e. 35 percent in the first time, 27 percent in the second time and 24 percent in the third time.

The non-compliance levels of not showing relationship between goodwill balances and goodwill allocated to CGUs in the fluctuation manners belong to clients of Deloitte, KPMG and PWC, in the increasing tendency belong to clients of EY and in the decreasing tendency involve clients of other audit firms. It appears from the data in Table III that the lowest non-compliance rate belongs to the clients of Deloitte in comparison with remaining audit firm clients, including other audit firm clients.

The next analysis technique provides more evidence of compliant levels of audit firm clients bearing on CGU aggregation, which is illustrated in Table IV. The data show the relationship between the number of CGUs and the number of business segments in the multi-year data set.

There was evidence of unsubstantial variations of audit firm clients pertaining to the relationship between the number of CGUs and the number of segments in the time series.

Sectors	Deloitte 1st time	Deloitte 2nd time	Deloitte 3rd time	EY 1st time	EY 2nd time	EY 3rd time	KPMG 1st time	KPMG 2nd time	KPMG 3rd time
CGU > segments	6	10	8	2	4	7	2	6	4
CGU = segments	12	11	18	2	6	7	5	3	3
CGU < segments	21	36	32	17	27	28	3	14	16
No effective disclosure	4	10	5	12	14	16	8	8	7
Proportion of firms where CGUs < segments or no effective disclosure (%)	58.1	68.7	58.7	87.9	80.4	75.9	61.1	71.0	76.7

Sectors	PWC 1st time	PWC 2nd time	PWC 3rd time	Non-Big 4 1st time	Non-Big 4 2nd time	Non-Big 4 3rd time	Total 1st time	Total 2nd time	Total 3rd time
CGU > segments	8	8	12	0	1	3	18	29	34
CGU = segments	11	19	16	1	4	4	31	43	48
CGU < segments	17	21	33	5	16	20	63	114	129
No effective disclosure	20	24	15	5	7	10	49	63	53
Proportion of firms where CGUs < segments or no effective disclosure (%)	66.1	62.5	63.2	90.9	82.1	81.1	69.6	71.1	68.9

Table IV. Segments and CGU aggregation by auditors

Clearly, the percentages of each year audit firm clients-defined fewer number of CGUs than the number of segments and provided no effective information pertaining to the number of CGUs were much higher than that of audit firm clients-defined number of CGUs equal or higher than the number of segments.

Specifically, the proportion of firms where CGUs lower than segments or no effective disclosure was in the fluctuation belonging to clients of Deloitte, PWC, and in the increasing trend involving clients of KPMG, in the decreasing trend belonging to clients of EY and other audit firms. The data show that clients of other audit firms have highest rates of non-compliance compared to Big 4 audit firms, especially Deloitte. This suggests a higher risk of CGU aggregation relating to other audit firm clients than that in clients of Big 4 firms, particularly Deloitte.

Other technique of analytical procedure is employed for identifying audit firm bearing on the quality of discount rate disclosure for estimating the CGU-recoverable amount in the multi-year data set, which is exhibited in Table V. The data show that there was little evidence of material changes in the various approaches applied by audit firm clients in the multi-year data set. The dominated method applied pertaining to the discount rate was a single discount rate for all defined CGUs, even though each CGU has different inherent risk characteristics, followed by the using of multiple discount rates and the providing no effective disclosure and range of discount rates.

Overall, a high proportion of audit firm clients reporting no effective disclosure in relation to discount rate has a falling tendency. The highest level of non-compliance pertaining to discount rate involves clients of PWC in comparison with remaining audit firm clients, particularly Deloitte.

The data also show that clients of audit firms employed unusually low discount rate. Specifically, on the whole discount rate was 1.4 percent in the first-year adoption, 3.8 percent in the second time and 2.6 percent in the third time. Applying lower mean discount rates in the model of discounted cash flow would result in overestimating present values (recoverable amounts), and, consequently, reduce the chance to recognize impairment expenses in the accounting period, and to increase accounting profit recognized in the consolidated financial statements.

A scrutiny of data to growth rates employed in the discounted cash flow model for estimating recoverable amount of each CGU in the multi-year data set. It is striking that the non-compliant levels of long term growth rate with disclosure requirements were very high, but in the slightly decreasing tendency, i.e. 73 percent in the first time, 72 percent in the second time and 67 percent in the third time.

The highest percentage of non-compliance with disclosure requirements pertaining to growth rate belongs to clients of other auditors in comparison with clients of Big 4 audit firms, particularly KPMG. By not disclosing long term growth rate, terminal values cannot be calculated and the accuracy of present values in the model of discounted cash flow is questionable.

Table VI shows the growth rate employed for testing impairment regime. The average estimated growth rates employed by other auditor clients were higher than that chosen by Big 4 auditor clients, particularly Deloitte and EY. By using higher growth rates in the model of discounted cash flow, other things being equal, would increase the determined recoverable amount of CGU assets, and reduce the chance of recognizing goodwill impairment expenses, and increase the possibility of reporting accounting profit in a given year.

In addition, average estimated forecast horizon chosen by other audit firm clients were also higher than that selected by Big 4 audit firm clients of audit firms, particularly PWC. By choosing the average forecast period higher than the stipulated forecast period in the HKAS 36, justifications have not been pointed by reporting sample clients.

	Deloitte			EY			KPMG		
Sectors	1st time	2nd time	3rd time	1st time	2nd time	3rd time	1st time	2nd time	3rd time
Multiple explicit discount rate	1	7	11	6	5	8	3	3	2
Single explicit discount rate	39	47	44	15	31	36	6	18	16
Range of discount rates	2	5	2	2	3	4	1	2	3
No disclosure	–	2	3	8	5	5	2	5	5
Proportion of firms where no disclosure (%)	0.0	3.3	5.0	25.8	11.4	9.4	16.7	17.9	19.2
Minimum discount rate (%)	4.13	3.80	5.00	1.40	4.00	3.10	4.50	4.20	5.00
Maximum discount rate (%)	15.00	23.50	22.36	18.30	25.00	23.70	17.80	25.80	25.90
Median discount rate (%)	8.65	9.00	10.00	6.50	9.00	10.00	9.93	9.80	10.88
Mean discount rate (%)	8.96	9.55	11.26	7.98	9.56	9.68	9.18	9.96	10.79
	PWC			Non-Big 4			Whole sample		
Sectors	1st time	2nd time	3rd time	1st time	2nd time	3rd time	1st time	2nd time	3rd time
Multiple explicit discount rate	5	7	8	–	2	2	15	24	31
Single explicit discount rate	23	34	39	5	18	27	88	148	162
Range of discount rates	2	2	6	1	2	5	8	14	20
No disclosure	14	23	15	2	2	–	26	37	28
Proportion of firms where no disclosure (%)	31.8	34.8	22.1	25.0	8.3	0.0	19.0	16.6	11.6
Minimum discount rate (%)	5.00	4.50	2.60	5.58	5.50	4.68	1.40	3.80	2.60
Maximum discount rate (%)	17.00	17.93	20.00	18.00	23.13	20.00	18.30	25.80	25.90
Median discount rate (%)	10.00	10.00	10.44	14.00	11.13	10.78	9.50	9.83	10.00
Mean discount rate (%)	9.85	9.77	10.93	11.58	11.20	11.48	9.17	9.84	10.80

Table V.
Analysis of discount rates used to test impairment (value in use and mixed method used only)

Table VI.
Analysis of growth rates used to test impairment (value in use and mixed method used only)

Sectors	Deloitte 1st time	Deloitte 2nd time	Deloitte 3rd time	EY 1st time	EY 2nd time	EY 3rd time	KPMG 1st time	KPMG 2nd time	KPMG 3rd time
Multiple explicit growth rate	1	1	5	3	3	4	2	3	2
Single explicit growth rate	5	10	11	8	10	16	6	8	7
Range of growth rates	–	1	2	–	1	–	–	1	–
No disclosure	36	49	42	20	30	33	4	16	17
Proportion of firms where no disclosure (%)	85.7	80.3	70.0	64.5	68.2	62.3	33.3	57.1	65.4
Minimum growth rate (%)	0.00	−1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.50
Maximum growth rate (%)	6.90	9.00	26.76	10.00	14.00	12.00	6.54	6.54	8.00
Median growth rate (%)	0.00	1.50	2.75	0.00	1.25	3.90	4.65	3.03	5.00
Mean growth rate (%)	1.88	2.54	3.40	1.85	3.11	3.29	3.52	3.32	4.94
Sectors	PWC 1st time	PWC 2nd time	PWC 3rd time	Non-Big 4 1st time	Non-Big 4 2nd time	Non-Big 4 3rd time	Whole sample 1st time	Whole sample 2nd time	Whole sample 3rd time
Multiple explicit growth rate	3	6	3	–	–	1	9	13	15
Single explicit growth rate	8	9	14	–	5	8	27	42	56
Range of growth rates	1	4	5	–	1	1	1	8	8
No disclosure	32	47	46	8	18	24	100	160	162
Proportion of firms where no disclosure (%)	72.7	71.2	67.6	100.0	75.0	70.6	73.0	71.7	67.2
Minimum growth rate (%)	0.00	0.00	0.00	n/d	2.00	0.00	0.00	−1.00	0.00
Maximum growth rate (%)	13.00	20.00	15.60	n/d	7.00	21.00	13.00	20.00	26.76
Median growth rate (%)	3.70	2.00	3.40	n/d	4.00	3.00	3.00	2.88	3.40
Mean growth rate (%)	4.61	3.47	3.99	n/d	4.30	6.13	3.11	3.25	3.99

5. Conclusion

This research is conducted for finding evidence which might reveal variations in audit quality among auditors (Deloitte, EY, KPMG, PWC and other audit firms) in the multi-year data set. The methodology applied in this study focused on the nature and quality of disclosures in relation to the goodwill impairment testing process under HKAS 36.

Basing on accumulated evidence obtained from the sample of listed firms in Hong Kong in three years after HKFRS adoption, including HKAS 36. By testing the basic disclosure requirements pertaining to goodwill impairment such as method used, CGU aggregation and specific disclosure requirements in relation to related assumptions such as variables of discount rates and growth rates in the discounted cash flow model, the research found that there was systematically non-compliant levels and poor disclosure quality pertaining to goodwill impairment among clients of auditors in the multi-year data set after HKFRS adoption.

Taking an overview of the whole sample, variations of non-compliant rates with disclosure requirements pertaining to goodwill impairment was small and in the slightly decreasing tendency in the time series. Taking specific audit firm clients in each year sample, the highest rates of non-compliance with disclosure requirements pertaining to goodwill impairment stick to clients of other audit firms in comparison with clients of Big 4 auditors. Out of Big 4 auditors, clients of Deloitte were judged, on the whole, to be the best practice disclosure bearing on goodwill impairment testing process. There have been alternative positions of higher levels of non-compliance among clients of EY, KPMG and PWC.

Apparently, the extent of compliant rates with HKFRS, including HKAS 36, is likely to be positively related to the probability of detecting and reporting material misstatements in the accounting system of a company. Variations in disclosure of goodwill impairment of audit firm clients are likely to be the result of audit quality variations in the multi-year data set. Based on the falling tendency of non-compliance levels with disclosure quality bearing on goodwill impairment, audit quality in the following years is judged to be higher than that in the previous years. Evidence obtained in this research may contribute to the literature by supporting the proposition that quality of Big 4 auditors is seen to be higher than that of non-Big 4 audit firms and audit quality among Big 4 auditors is subject to variation.

References

Balvers, R.J., Macdonald, B. and Miller, R.E. (1988), "Underpricing of new issues and the choice of auditor as a signal of investment banker reputation", *The Accounting Review*, Vol. 63 No. 4, pp. 605-622.

Becker, C.L., Defond, M.L., Jiambalvo, J. and Subramanyam, K.R. (1998), "The effect of audit quality on earnings management", *Contemporary Accounting Research*, Vol. 15 No. 1, pp. 1-24.

Caneghem, T.V. (2004), "The impact of audit quality on earnings rounding-up behaviour: some U.K. evidence", *European Accounting Review*, Vol. 13 No. 4, pp. 771-786.

Carlin, T.M., Finch, N. and Laili, N.H. (2009), "Investigating audit quality among Big 4 malaysian firms", *Asian Review of Accounting*, Vol. 17 No. 2, pp. 96-114.

Copley, P.A., Doucet, M.S. and Gaver, K.M. (1994), "A simultaneous equations analysis of quality control review outcomes and engagement fees for audit of recipients of federal financial assistance", *The Accounting Review*, Vol. 69 No. 1, pp. 244-256.

Dang, L. (2004), "Assessing actual audit quality", PhD thesis, Drexel University, PA.

Deangelo, L.E. (1981), "Audit size and audit quality", *Journal of Accounting and Economics*, Vol. 3 No. 3, pp. 183-199.

Defond, M.L. and Jiambalvo, J. (1991), "Incidence and circumstances of accounting errors", *The Accounting Review*, Vol. 66 No. 3, pp. 643-655.

Eisenberg, T. and Macey, J.R. (2003), "Was Arthur Andersen different? An empirical examination of major accounting firms' audits of large clients", *Journal of Empirical Legal Studies*, Vol. 1, pp. 263-300.

Firth, M. and Smith, A. (1992), "Selection of auditor firms by companies in the new issue market", *Applied Economics*, Vol. 24 No. 2, pp. 247-255.

Fuerman, R.D. (2004), "Audit quality examined one large CPA firm at a time: mid-1990s empirical evidence of a precursor of Arthur Andersen's collapse", *Corporate Ownership and Control*, Vol. 2 No. 1, pp. 137-148.

Hoogendoorn, M. (2006), "International accounting regulation and IFRS implementation in Europe and beyond – experiences with first-time adoption in Europe", *Accounting in Europe*, Vol. 3 No. 1, pp. 23-26.

Kit, F.Y. (2005), *Evidence of Audit Quality Differences among Big Five Auditors: An Empirical Study*, City University of Hong Kong, Kowloon Tong.

Krishnan, J. and Schauer, P.C. (2000), "The differentiation of quality among auditors: evidence from the not-for-profit sector", *Auditing: A Journal of Practice and Theory*, Vol. 19 No. 2, pp. 9-25.

Moize, P. (1997), "Auditor reputation: the international empirical evidence", *International Journal of Auditing*, Vol. 1 No. 1, pp. 61-74.

Palmrose, Z.-V. (1988), "An analysis of auditor litigation and audit service quality", *The Accounting Review*, Vol. 63 No. 1, pp. 55-73.

Simunic, D.A. (2003), *Audit Quality and Audit Firm Size: Revisited*, The University of Bristish Columbia, Vancouver.

Corresponding author
Manh Dung Tran can be contacted at: manhdung@ktpt.edu.vn