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Audit Quality Differences Among Auditors: The Case of Hong Kong

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Abstract

Audits play a critical role in satisfying the public interest in strengthening accountability and supporting confidence in financial reporting. Conventionally, audit quality is defined as a probability that financial statements are free from material misstatements. The existence of a positive relationship between audit firm size and audit quality has long been accepted in previous literature. This has resulted in numerous studies collecting evidence of differential audit quality relative to the size of audit firms, both large and small. Consequently, the conclusion has been asserted that larger audit firms produce a higher and more homogenous audit quality. The collapse of Arthur Andersen, however, has undermined the premise that large audit firms provide higher audit quality than smaller firms. This research investigates audit quality based on the extent of compliance levels with disclosure requirements pertaining to goodwill impairment of large listed Hong Kong firms in the third year transition to International Financial Reporting Standards (IFRS). The result found that audit firm identity appears to be a significant proportion of cross-sectional variation, in which compliance levels and disclosure quality varied considerably among auditors.

Keywords: Goodwill accounting; audit quality; HKAS 36; impairment testing; Hong Kong.

1. Introduction

Audits serve a vital economic purpose and play an important role in satisfying the public interest in strengthening accountability and supporting confidence in financial reporting (ICAEW, 2005). The audit industry is becoming more and more important in the eyes of financial statement users as the concept of '*true and fair*' of financial statements is often violated and there are increasing irregularities and frauds relating to accounting and financial reporting.

Audit quality is regarded as one of the key issues in audit activities (Kit, 2005) and is defined as the probability that financial statements are fairly presented when an unqualified opinion is given (Simunic, 2003). It has long been accepted that large audit firms are associated with high audit quality in much of the literature (DeAngelo, 1981; Balvers et al., 1988; Palmrose, 1988; Firth and Smith, 1992; Teoh and Wong, 1993; Copley et al., 1994; Moize, 1997). Typically, the quality of audit services conducted by large audit firms has been regarded as homogenous. However, the collapse of Arthur Andersen has undermined the belief that large audit firms provide higher audit quality than smaller ones.

A high audit quality depends greatly on the technical competence and independence of the auditor and their ability to detect material misstatements. According to Dang (2004), a high audit quality is associated with high quality information pertaining to financial reports because financial reports audited by high quality auditors are less likely to contain material irregularities. Normally, an audit includes examination of accounting documents, accounting methods and evidence relevant to the amounts and disclosures in the financial statements, and collects sufficient evidence to give reasonable assurance that financial statements contain no material irregularities.

Consequently, a large number of countries, including Hong Kong, switched to an IFRS-based financial reporting framework. The adoption of IFRS is considered to be the most revolutionary financial reporting development and is very difficult for financial statement preparers to apply in practice.

To coincide with the introduction of IFRS, Hong Kong designed its own accounting framework, the Hong Kong Financial Reporting Standards (HKFRS), which came into effect on 1 January 2005. Owing to the over-complexity and challenging technical requirements of HKFRS, not to mention some difficult pertinent issues including financial instruments, impairment and pensions, there was a high possibility that inherent misstatements in the financial reports of reporting firms in the early years after IFRS implementation would occur. Subsequently, misstatements in a client's accounting system are very difficult for an auditor to detect, and hence, audit quality may be impacted. Moreover, the combination of increased market, regulatory and technical pressure may result in implications for variations in audit quality.

The preparation of financial statements in compliance with the technical requirements of HKAS 36 or IAS 36 requires reporting firms to apply some financial principles drawn from discounting, forecasting and valuation models under potentially uncertain conditions. Different subjective assumptions relating to

for example, discount rates, long-term growth rates and forecast periods, produce different outcomes for present values that are discounted from future cash flows, and evaluating which is the best outcome is extremely difficult and potentially contentious.

The adoption of an IFRS-based financial reporting framework has not produced big changes in the format and nature of goodwill in the statement of financial position and goodwill impairment in the statement of comprehensive income, but has yielded dramatic changes in the face of notes to financial statements, i.e. reporting firms are required to disclose abundant financial information relating to the goodwill impairment testing regime.

Because audit assurance (and therefore audit quality) is likely to be positively related with compliance with accounting standards (Copley et al., 1994; Mollik and Bepari, 2010; Carlin et al., 2007; Krishnan and Schauer, 2000), variations in disclosure of goodwill impairment in the note-form of financial statements are likely to be the result of variations in audit quality. Thus, the measure of audit quality employed in this research is the extent of compliance variations with the disclosure requirements pertaining to goodwill impairment in the dataset of 2007. So the level of technical compliance with requirements of disclosures is regarded as a surrogate for audit quality in relation to the challenging and highly intricate provisions of the goodwill impairment testing regime. Basing on the positive relationship between audit quality and compliance levels with accounting standards, some researchers also evaluated variations of audit quality in different jurisdictions such as in the context of Malaysia (Laili and Khairil, 2013), Singapore (Carlin et al., 2010).

This research is structured as follows. Section 2 reviews the relevant literature on audit quality. Section 3 describes the data sample collection and methodology employed in the conduct of the research. Section 4 discusses 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 an important element of corporate governance and can be defined as the probability that an auditor discovers and reports material misstatements in the accounting system of a company (DeAngelo, 1981; Watts and Zimmerman, 1986). In other words, audit quality is understood to be the probability that financial statements are free from material omissions or misstatements (Palmrose, 1988). Based on these concepts, audit quality consists of two elements; the first is generally related to technical competence and the second is related to the 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. Owing to the nature of the audit process and the reporting of audit outcomes, evaluation of audit quality for particular audit engagements is somewhat murky (Teoh and Wong, 1993). Thus, assessing audit quality is one of the most controversial issues for researchers.

Auditor size is by far one of the most frequently used as a surrogate for audit quality in previous literature. De Angelo (1981), one of the earliest authors in the field of audit quality,

analytically demonstrates that larger audit firms have more clients, more independence from their clients, better reputations and more to lose by failing to report discovered misstatements in the financial statements than smaller audit firms. This motivates large audit firms to work harder than their smaller counterparts, and *ceteris paribus*, greater effort translates to a higher audit quality. DeFond and Jiambalvo (1991) found that larger audit firms incur costs in developing a reputation for adding value to the audit and are better able to detect and report material misstatements in the financial reports.

A body of empirical evidence is ostensibly consistent with the hypothesis that large audit firms provide higher audit quality than small ones. Moize (1997) suggested that large firms' audit fees are higher than smaller firms' audit fees. The reason is that a higher audit fee is associated with a greater number of hours and a better reputation implies a higher audit quality. In the study of Becker et al. (1998), the results show that discretionary accruals of clients with smaller auditors are higher than that of clients with large auditors. In other words, higher audit quality should be more likely to successfully detect and prevent earnings management.

Consistent with the assumption that large audit firms assure higher quality audits, capital market research has shown that the stock market reacts more strongly when a client shifts to a large audit firm and reports higher earnings response coefficients compared to the client of a smaller audit firm (Teoh and Wong, 1993). Large auditors have been found to have lower litigation occurrence rates than smaller audit firms (Palmrose, 1988). Krishnan and Schauer (2000) proved that the compliance levels with GAAP reporting requirements of large audit firm clients are higher than that of small audit firm clients and assumed that the extent of GAAP compliance is likely to be related to the probability of detecting and revealing material misstatements. In addition, Street and Gray (2002) found that the levels of compliance with IFRS disclosure are positively associated with clients being audited by large auditors.

Much more of the literature also provides empirical evidence for asserting that auditor size is a surrogate for audit quality. However, the bankruptcies of firms such as WorldCom and Enron, as well as the demise of Arthur Andersen (previously among the largest audit firms in the world) in 2002, have tarnished the good image of the audit industry and raised serious concerns as to the quality of audits. Arthur Andersen is alleged to have violated the anti-fraud precepts and engaged in schemes that fraudulently misrepresented the results of its clients' activities (Chaney and Philipich, 2002), which clearly documents a lack of quality in properly detecting and reporting material misstatements in the accounting systems of its clients.

Chaney and Philipich (2002) investigated the impact of the collapse of Arthur Andersen on the firm's clients and found that Andersen's clients experienced a statistically negative market reaction, with investors downgrading the audit quality conducted by Andersen. As a result, to some extent, the audit giant's collapse undermined the long-held assertion that large audit firms provide higher audit quality. A small number of recent studies have examined the possibility of differential audit quality among large audit firms, rather than assuming that

there is a homogeneous audit quality among them.

Fuerman (2004) investigated the possibility of audit quality differentials among large audit firms by examining financial disclosures pertaining to private securities class actions for the period from 1996 to 1998. This research found that Arthur Andersen produced lower quality audits than the other Big 6 auditors, but distinguishing audit quality among these audit firms was impossible.

In contrast, Eisenberg and Macey (2003) analysed the financial restatements conducted by auditors and found no evidence of audit quality differentials among large audit firms, including Arthur Andersen. Other studies have also concluded that there is no difference in audit quality among large auditors (Tilis, 2006). Meanwhile, by using earnings forecast errors in the prospectuses of IPOs in Singapore, Lam and Chang (1994) even concluded that there is no difference in audit quality between large and small audit firms. Likewise, Petroni and Beasley (1996) found no systematic differences in claim loss accuracy or bias between clients of large and small audit firms.

Audit quality has been one of the most important issues in the field of audit research (Kit, 2005). While the audit quality literature has a propensity to support the proposition that audit quality conducted by large auditors exceeds that performed by small auditors, there is little evidence to show audit quality variation among large auditors. Because aspects of detecting and reporting material misstatements are unobservable (Krishnan and Schauer, 2000), researchers have chosen two methods for measuring audit quality in empirical work, namely, indirect and direct methods. The evaluation of audit quality by the indirect method tends to stem from a process of comparing observed values for some accepted proxies for quality among audit firms, while attempts to measure audit quality by the direct method is through the process of an audit.

The former approach seems to be more straightforward than the latter. As a result, the majority of literature measures audit quality using the indirect method (via proxy), including fee differentials (Copley, 1991; Moize, 1997), abnormal accruals (Yu, 2007), litigation occurrence and resolution (Palmrose, 1988), earnings forecast accuracy (Behn et al., 2008), earnings response coefficients (Teoh and Wong, 1993), earnings management (Becker et al., 1998), earnings forecast error (Lam and Chang, 1994), and users' perceptions (Schroeder et al., 1986; Boon, 2007).

In contrast, measuring audit quality using the direct method is more difficult and costly. Under this method, audit quality is measured by quality control review (Donald and Giroux, 1992), audit processes (Sutton and Lampe, 1991), peer review (Colbert and Murray, 1998), and audit performance (Blokdijk et al., 2006). The direct method requires researchers to have an involvement in an audit team, or to have direct access to audit working papers and audit files, or is based on peer review processes performed in relation to audit engagements (Carlin et al., 2009).

As discussed above, the matter of audit quality variations among large audit firms is a very important issue and needs to be investigated. Further, in countries where the adoption of an IFRS-based reporting framework has coincided

with other types of structural shifts impacting much on audit service provisions, significant emphasis has been directed toward audit firms (Carlin et al., 2009).

Measuring and reporting goodwill in an IFRS framework has produced significant challenges for Hong Kong reporting firms. Almost all reporting firms have been impacted by the highly prescriptive impairment test under HKAS 36. With overly-complex and challenging requirements, recognising, measuring and reporting goodwill and its impairment becomes very difficult for reporting firms. Under HKAS 36, reporting firms are supposed to deal with considerably expanded disclosure requirements, in particular, pertaining to the method employed to determine the CGU recoverable amount, and key assumptions in each methodology.

The value of goodwill is impaired in the financial year if the recoverable amount of portfolios of assets (CGUs) is lower than the carrying amount related to those assets. Under HKAS 36, the recoverable amount is defined as the higher of an asset's or a CGU's fair value less costs to sell and its value in use. It transpires that reporting firms are required to benchmark (select) either a fair value or value in use method for projecting the CGU recoverable amount, and each approach produces substantial implications for the types of disclosures provided by reporting 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,[1] whereas more specific and highly detailed disclosures are required when adopting value in use as a benchmark for determining the recoverable amount of CGU. Detailed disclosure requirements for employing value in use for estimating recoverable amounts are stipulated in paragraph 134(d) of HKAS 36.

The adoption of new accounting standards for goodwill has not produced significant changes to the format and nature of information recognized on the balance sheet and income statement, but it has considerably changed the disclosure of information related to goodwill in the notes to the consolidated financial reports. These changes are disclosed in the significant accounting policies and a specific note for justifying the value of goodwill in the statement of financial position.

From an audit perspective, the IFRS framework results in overwhelming increases in information disclosures in the notes to the financial statements, and requires more involvement of auditors in achieving full compliance (Hoogendoorn, 2006). The volume of audit work increases significantly due to the intricate provisions of IFRS.

The level of vigilance required on the part of auditors to data in the financial statements is also entirely different. Libby et al. (2006) proved that partners of the Big 4 auditors require more corrections of misstatements in recognised amounts in the balance sheet and income statement than in the notes to the accounts. This suggests that high priority is given to minimising errors or irregularities in the balance sheet and profit and loss statement, and low priority is attached to significant accounting policies as well as a specific note of goodwill in the notes to the accounts.

Shifting to an IFRS-based regime for goodwill impairment has had a big impact on

disclosures in the notes to financial reports. In particular, the highly detailed disclosure requirements in HKAS 36 represent a good opportunity to investigate the compliance issue, and gain insights into the audit quality differentials among auditors. Since the goodwill impairment standard is the one used to identify misstatements in the accounting system of an entity, the extent of compliance with this accounting standard is likely to be directly correlated with the probability of discovering and reporting irregularities in the accounting system, or audit quality.

In contemplating the technical requirements of the impairment testing process and disclosure under HKAS 36, some critical risk issues were scrutinised. The first of these issues relates to the manner in which CGUs are defined for the purposes of goodwill impairment testing. The second involves the method employed and related assumptions in each method in the process of impairment testing.

Previous studies show the importance of technical processes in relation to goodwill impairment testing process (Lonergan, 2007; Carlin et al., 2009). One key challenge that emerges in HKAS 36 is the manner in which goodwill is allocated to CGUs for the purposes of impairment testing. A particular risk relating to this process is known as the CGU aggregation problem (Carlin et al., 2007), where too few CGUs are defined or disclosed. This means that impairment expenses may be avoided or at least deferred. So retained earnings may be over-estimated as a result of defining too few CGUs than normal.

The selection of discount rates, long-term growth rates and forecast periods in a model of discounted cash flow (DCF), where a firm adopts the method of value in use in the process of goodwill impairment testing, is also of great interest. Evidently, the over-complex requirements stated in HKAS 36, the selection of methods conducted by listed firms, the appropriate assumptions given, the rate of compliance with complex technical requirements and the quality of disclosures made pursuant to the goodwill impairment testing regime, all provide much evidence for evaluating variations on audit quality among auditors in the context of Hong Kong.

3. Data collection and research methodology

IFRS came into effect in Hong Kong for firms with reporting periods on or after 1 January 2005. So the year 2007 is considered as being the third year for reporting firms in Hong Kong to employ the IFRS-based framework.

In constructing the final research sample, a number of steps were taken. First, firms were required to be the members of the Main Board of Hong Kong Stock Exchange (HKEx) as at December 2007. Through the Worldscope Datastream Database, there were 1,048 listed firms with total market capitalisation of $20,536 billion. Second, the 500 biggest market value firms with a market capitalisation of $20,242 billion (accounting for 98.57% of total market capitalisation) were chosen. 236 firms were excluded from the final sample due to not having goodwill as comprising an element of their assets in the consolidated financial statements. As a result, this process constructed a commencing sample of 264 firms with a market value of $12,922 billion, representing 62.93% of total market value in the HKEx at

Table 1: Overview of research sample

Sectors	Number of firms	Total assets ($ million)	Total goodwill ($ million)	Goodwill as % of total assets
Consumer Goods & Conglomerate	77	2,232,557.57	82,981.53	3.72%
Financials	25	33,189,160.81	332,073.77	1.00%
Telecommunication & Services	62	1,760,793.76	96,021.53	5.45%
Materials & Industrial Goods	37	531,686.67	11,193.52	2.11%
Utilities, Energy & Construction	63	2,422,749.97	39,435.56	1.63%
Total (n)	264	40,136,948.78	561,705.91	1.40%

the end of December 2007.

To allow for industry segmentation of data, all firms were allocated to one of five industry groupings comprising organizations related to principle lines of business. These sectors are Consumer Goods and Conglomerates; Financials; Telecommunication and Services; Materials and Industrial Goods; and Utilities, Energy and Construction.

For the purpose of analysis in this study, auditors are classified based on the big 4 audit firms including Deloitte, Ernst & Young (E&Y), KPMG, PricewaterhouseCoopers (PWC) and Others, consisting of all non-big 4 auditors (Baker Tilly Hong Kong Ltd., BDO MaCabe Lo. Ltd., CCIF CPA Ltd., Chu and Chu CPA, Grant Thornton, H.C.Watt & Co., Ltd., HLB Hodgson Impey Cheng, Lo and Kwong CPA Co., Ltd., Mazars CPA Ltd., Moores Rowland Mazars, Moores Stephens, RSM Nelson Wheeler, Shinewing (HK) CPA Ltd., Shu Lun Pan Horward HK CPA Ltd. and Ting Ho Kwan & Chan).

At the date of sampling, 264 large listed firms included in the final sample have asset values of $40,136 billion, containing goodwill of $561.7 billion. An overview of the research sample consists of assigned sectors; Hong Kong dollar value of firm assets and dollar value of goodwill within each sector are illustrated in Table 1.

Listed firms in the field of *Financials* have both the highest absolute amounts of assets and goodwill; the percentage of goodwill per assets is of lowest value in comparison with other fields. The proportion of goodwill per assets of listed firms in the field of *Telecommunication & Services* is highest.

Table 2 shows the number of firms audited by auditors, and by industry sectors. The number of auditees for each auditor is uneven, with PWC dominating at 28.8% of the firms in the sample, followed by Deloitte, E&Y, and other auditors at 23.9%, 22% and 14%, respectively, and KPMG with a minimal share of 11.4% in the research sample. In terms of sectors, listed firms in *Consumer Goods & Conglomerate* dominate at 29.2%, followed by firms in *Utilities, Energy & Construction*, *Telecommunication & Services, Materials & Industrial Goods* at 23.8%, 23.5% and 14%, respectively, and the lowest percentage in the final sample belongs to listed firms in the field of *Financials.*

Key descriptive statistics for the sample firms sorted by auditor identity are set out in Table 3. On average, clients audited by other auditors were smaller, as measured by market

Table 2: Number of firms audited by sectors

Sectors	No. of firms	Deloitte	E&Y	KPMG	PWC	Others
Consumer Goods & Conglomerate	77	16	21	4	21	15
Financials	25	5	7	9	4	-
Telecommunication & Services	62	13	10	6	24	9
Materials & Industrial Goods	37	11	8	7	6	5
Utilities, Energy & Construction	63	18	12	4	21	8
Total (n)	264	63	58	30	76	37
Percentages of the whole sample	100.0%	23.9%	22.0%	11.4%	28.8%	14.0%

value, than the clients of the Big 4 auditors, especially KPMG. Potential earnings sensitivity of other auditor clients to impairment expenses on goodwill write-down, on average, was also higher than for clients of Big 4 auditors included in the sample.

A central question of this research is the extent to which the auditees comply with over-complex technical provisions of a new and challenging standard. Potential interests of CGU issue, discount rate and growth rate disclosures should be scrutinized under HKAS 36.

Consistent with Carlin et al. (2009), six analytical procedures 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 to sell 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 report method disclosure. This data supported the development of insight into a compliance level with basic disclosure requirements stipulated in HKAS 36.

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 partial 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. It is a basic requirement in paragraph 80 that for the purpose of impairment testing, goodwill should be allocated to each of the CGUs or groups of CGUs that are expected to benefit

Table 3: Descriptive statistics of firms by auditors

Items	Deloitte n=63	E&Y n=58	KPMG n=30	PWC n=76	Others n=37
Mean Market Capitalisation ($ million)	19,512	15,679	241,804	44,105	4,815
Mean Assets ($ million)	17,098	30,137	1,046,895	75,669	4,165
Mean Goodwill ($ million)	514	493	12,828	1,409	237
Mean NPBT ($ million)	6,571	1,568	20,863	3,667	156
GW as % assets (financials)	3.62%	0.47%	1.08%	0.08%	-
GW as % assets (non-financials)	2.91%	3.19%	3.47%	3.24%	5.69%
GW as % assets (all sectors)	3.01%	1.64%	1.23%	1.86%	5.69%
Ratio of GW : NPBT	0.08:1	0.31:1	0.61:1	0.38:1	1.52:1

from the synergies of the combination. So this data helps financial users with insight into the compliance level with basic disclosure requirements prescribed in HKAS 36.

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 business segments for the purpose of segment information reporting. So this data provides evidence of appropriate CGU aggregation on the part of reporting firms.

Fourth, the firms in the research sample were classified by audit firm, according to calculated ratio of CGUs to business segments. This data provides more evidence of CGU aggregation on the part of reporting firms and combines with the procedure prescribed in the third step for assuring whether CGU aggregation is appropriate.

Fifth, the sample firms were sorted by audit firm, according to the quality of discount rate disclosure in the goodwill impairment testing process. Data was stratified into four categories, namely, multiple discount rates, single discount rate, range of discount rates and no effective disclosure. Firms categorised in the first category 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 aligns with the standard requirements and provides a higher assurance of process quality through different discount rates to each defined CGU.

Firms in the second category, i.e. '*single discount rate*', revealed that they defined the same company discount rate for all defined CGUs for estimating CGU recoverable amount in the discounted cash flow model. This did not appear to comply with the requirements that a discount rate unique to each defined CGU and each CGU risk was arguably different.

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

Finally, allocation of firms to the fourth category signified that the firms failed to provide adequate discount rate disclosure and in consequence provided no meaningful information for financial report users to evaluate the robustness of the goodwill impairment testing regime. Therefore, these firms were judged to have poor disclosures and not to conform to the disclosure requirements of HKAS 36.

Sixth, the sample firms were filtered by audit firm identity, according to the quality of growth rate disclosure in the process of goodwill impairment testing. Data was stratified according to a very similar taxonomy to that described bearing on 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, the fourth the poorest.

4. Results and discussion

The interest of this research focuses on audit quality variation among auditors based on the reporting firms' compliance with disclosure requirements relating to goodwill

Table 4: Method used for determining recoverable amount of CGUs

Method Employed	Deloitte n=63	E&Y n=58	KPMG n=30	PWC n=76	Others n=37	Total n=264
Fair value	2	1	3	1	1	8
Value-in-use	58	52	26	64	34	234
Mixed method	2	1	-	4	-	7
No effective disclosure	1	4	1	7	2	15
Proportions of auditees where no effective disclosure	1.6%	6.9%	3.3%	9.2%	5.4%	5.7%

impairment under HKAS 36. The first question in understanding the process of goodwill impairment testing is the selection of valuation methodology 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 based on market-based evidence, and its value in use, determined based on a discounted cash flow model. Table 4 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.

The data illustrates that the dominant approach to the estimation of recoverable amount was the approach of value in use. A total of 234 firms (accounting for 88.6% of the sample) employed this method as the exclusive basis for determining CGU recoverable amount. Only eight firms chose fair value as the sole basis for estimating CGU recoverable amount. A further seven firms disclosed that they applied a mixed method (employed value in use in some CGUs and fair value in others).

Up to 15 cases (about 5.7% of the final sample) failed to report the method employed for determining CGU recoverable amount. Specifically, clients of PWC provided no effective information relating to method used, at the highest percentage of 9.2%, followed by clients of E&Y, other auditors and KPMG at 6.9%, 5.4% and 3.3% respectively, and with clients of Deloitte at the lowest percentage in total, about 1.6%.

Under the requirements of HKAS 36, goodwill balance acquired in a business combination is subject to impairment testing whether the value of goodwill is immaterial compared with the values on the balance sheet. So the firms with failure of disclosure method used were judged not to comply with the disclosure requirements of the HKAS 36. However, based on only this analysis, it is not possible to reach a robust conclusion as to the possible variation in quality by audit firm.

The next analytical technique used 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. As set out in Table 5, the majority of firms fully complied with the disclosure requirements, accounting for 75% of the total sample (in this case it was possible to have matched data between value of goodwill on the balance sheet and the sum of goodwill allocated to CGUs). In only three

Table 5: CGU allocation compliance by auditors

Sectors	Deloitte n=63	E&Y n=58	KPMG n=30	PWC n=76	Others n=37	Total n=264
Fully compliant	56	38	22	56	26	198
Ostensibly compliant	1	1	1	-	-	3
Non-compliant	6	19	7	20	11	63
Proportion of firms where non-compliant	9.5%	32.8%	23.3%	26.3%	29.7%	23.9%

cases belonging to clients of Deloitte, E&Y and KPMG that goodwill value allocated partially to defined CGUs and discrepancies between goodwill value and the sum of goodwill allocated to CGU were immaterial.[2]

There were 63 cases (about 24% of the final sample), which provided no effective disclosure relating to goodwill allocation to defined CGUs. Clients of E&Y failed to disclose the effective disclosure pertaining to goodwill allocation to CGUs with the highest percentage of 32.8%. Followed by clients of non-Big4 auditors, PWC and KPMG were at 29.7%, 26.3% and 23.3%, respectively, and with clients of Deloitte at the lowest percentage in total, 9.5%.

From an audit firm identity, there was little evidence of cross-sectional variation in practice. In the first two analytical procedures applied to the sample data, however, it appeared that Deloitte's clients had the lowest percentage of non-compliant levels, whereas clients of remaining auditors had insignificant variation of non-compliant levels with the accounting standard. The next analysis procedure produces more evidence of compliant levels of audit firm clients relating to CGU aggregation, which is set out in Table 6.

Table 6 reveals that clients of non-big 4 auditors (other auditors) have a greater tendency to define fewer CGUs than business segments or report no meaningful disclosure of CGU definition than other clients of big 4 firms, especially Deloitte. According to the content of paragraph 80, each CGU or groups of CGUs to which the goodwill is so allocated will present the lowest level within the entity, and will not be larger than a segment of the company. So, clients of all audit firms violated the provision with different levels.

The data show that about 81% of other auditors defined fewer CGUs than business segments or provided no effective disclosure

Table 6: Business segments and CGU aggregation by auditors

Number of firms	Deloitte n=63	E&Y n=58	KPMG n=30	PWC n=76	Others n=37
CGU > Segments	8	7	4	12	3
CGU = Segments	18	7	3	16	4
CGU < Segments	32	28	16	33	20
No Effective Disclosure	5	16	7	15	10
Proportion of firms where CGUs < segments or no effective disclosure	58.7%	75.9%	76.7%	63.2%	81.1%

Table 7: Ratio of CGUs to business segments

Number of firms	Deloitte n=63	E&Y n=58	KPMG n=30	PWC n=76	Others n=37
No Effective Disclosure	5	16	7	15	10
CGU : Segment is between 0.00 - 0.50	25	24	13	21	18
CGU : Segment is between 0.51-0.99	7	4	3	12	2
CGU : Segment = 1	18	7	3	16	4
CGU : Segment is between 1.01-1.50	2	2	1	3	-
CGU : Segment>1.50	6	5	3	9	3
Mean CGU : Segment ratio	0.88	0.93	0.87	0.95	0.85
Median CGU : Segment ratio	0.67	0.50	0.50	0.75	0.50
Minimum CGU: Segment ratio	0.14	0.11	0.20	0.17	0.13
Maximum CGU : Segment ratio	5.00	8.00	4.50	4.00	5.00
% CGU : Segment > 1.01	12.7%	12.1%	13.3%	15.8%	8.1%

relating to the relationship between number of CGUs and number of business segments. In contrast, this happened in only 59% of Deloitte clients, with PWC, KPMG and E&Y clients at about 63%, 77% and 76%, respectively. This suggests a higher risk of CGU aggregation belonging to non-big 4 audit clients than that in clients of Big 4 firms, especially Deloitte.

The same pattern exists when calculating the ratios of CGUs to business segments and then stratifying and classifying under audit firm identity, which is illustrated in Table 7. Specifically, clients of other auditors have the lowest percentage of ratios of CGUs to business segments higher than 1. This suggests that these clients can potentially conceal impairment, and therefore prevent detection and overestimate earnings.

Other techniques of analytical procedure are employed for identifying an audit firm's quality

Table 8: Analysis of discount rates used to test impairment[4] (Value in use and mixed method used only)

Number of firms	Deloitte n=60	E&Y n=53	KPMG n=26	PWC n=68	Others n=34
Multiple explicit discount rate (n=31)	11	8	2	8	2
Single explicit discount rate (n=162)	44	36	16	39	27
Range of discount rates (n=20)	2	4	3	6	5
No disclosure (n=28)	3	5	5	15	-
Proportion of firms where no disclosure	5.0%	9.4%	19.2%	22.1%	0.0%
Minimum discount rate	5.00%	3.10%	5.00%	2.60%	4.68%
Maximum discount rate	22.36%	23.70%	25.90%	20.00%	20.00%
Median discount rate	10.00%	10.00%	10.88%	10.44%	10.78%
Mean discount rate	11.26%	9.68%	10.79%	10.93%	11.48%

Table 9: Analysis of growth rates used to test impairment[5]

Number of firms	Deloitte n=60	E&Y n=53	KPMG n=26	PWC n=68	Others n=34
Multiple explicit growth rate (n=15)	5	4	2	3	1
Single explicit growth rate (n=56)	11	16	7	14	8
Range of growth rates (n=8)	2	-	-	5	1
No disclosure (n=162)	42	33	17	46	24
Proportion of firms where no disclosure	70.0%	62.3%	65.4%	67.6%	70.6%
Minimum growth rate	0.00	0.00	0.50	0.00	0.00
Maximum growth rate	26.76	12.00	8.00	15.6	21
Median growth rate	2.75	3.90	5.00	3.40	3.00
Mean growth rate	3.40	3.29	4.94	3.99	6.13
Mean forecast period (years)[6]	6.89	5.74	6.82	5.61	7.37

of discount rate disclosure for estimating CGU recoverable amount. As presented in Table 8, clients of PWC provided less effective disclosure pertaining to discount rates than clients of the remaining big four auditors and non-big four auditors, particularly.

The data also shows that clients of audit firms employed unusually low discount rates.[3] Specifically, PWC clients adopted a rate of 2.6%, through to clients of E&Y at 3.1%, other audit firm clients at 4.68% and clients of Deloitte and KPMG at 5%. Applying lower mean discount rates in the model of discounted cash flow would result in overestimating present values (recoverable amounts), consequently reducing the chance of recognising impairment expenses in the accounting period, and increasing accounting profit recognised in the consolidated financial statements. However, there is little evidence of finding meaningful cross-sectional variation explained by audit firm identity.

A scrutiny of data to growth rates is employed in the discounted cash flow model for estimating recoverable amount of each CGU. Table 9 illustrates a different pattern in comparison with the pattern shown in the discount rate disclosure in practice. The highest percentage of non-compliance with the disclosure requirements belongs to clients of other auditors, accounting for about 71%, followed by clients of Deloitte, PWC, KPMG and E&Y at about 70%, 68%, 65% and 62% respectively.

Average estimated growth rates employed by other auditor clients (about 11.5%) were higher than that chosen by big 4 auditor clients, particularly E&Y (about 9.7%). 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 recognising goodwill impairment expenses, and increase the possibility of reporting accounting profit in a given year.

In addition, some clients of audit firms employed longer period than the prescription in the accounting standard, but no explanations

existed in the note-forms of financial statements. On the whole, the non-compliance levels pertaining to disclosing long-term growth rates in the clients of every category of auditors were very high.

5. Conclusion

This research is conducted to find evidence which might reveal variations in audit quality among auditors (Deloitte, E&Y, KPMG, PWC and non-Big 4 auditors). The methodology applied in this study focussed on the nature and quality of disclosures in relation to goodwill impairment testing process under HKAS 36 - *Impairment of Assets*.

The research is based on accumulated evidence obtained from the sample of listed firms in Hong Kong for the third year after HKFRS implementation, including HKAS 36. By testing the method adopted, CGU aggregation and variables of the discounted cash flow model, the low compliance levels and poor disclosure quality relating to goodwill impairment belong to clients of all audit firms. It appears that the levels of non-compliance and poor disclosure quality pertaining to goodwill impairment of other audit firm clients were higher than that of Big 4 audit firm clients.

Out of the Big 4 audit firms and non-Big 4 audit firms, clients of Deloitte were judged, on the whole, to be the best practice disclosure bearing on goodwill impairment testing process. Meanwhile, clients of E&Y, KPMG, PWC and other audit firms were evaluated to have substantial variations of practice disclosures relating to method employed, CGU aggregation and discount rates and growth rates.

Evidently, the extent of compliance levels with HKFRS including HKAS 36 is likely to be related to the probability of detecting and reporting material misstatements in the accounting system of an auditee. Variations in disclosure of goodwill impairment of auditees are likely to be the result of audit quality variation. So evidence collected in this research may contribute to the literature by supporting the proposition that audit quality of big 4 auditors is seen to be higher than that of non-big 4 auditors and the quality of an audit among Big 4 audit firms is not homogeneous as long accepted before, but is subject to variation. Further research on variations in audit quality among audit firms when compliance levels and disclosure quality of goodwill impairment in the time series is identified and discussed.

Notes:

1. As to which, see HKAS 36, Paragraph 134.
2. Materiality is determined by reference to the dollar value of the reconciliation gap compared against the dollar value of total goodwill balance of the firm.
3. This judgment is based on the long-run sovereign risk-free rate in jurisdictions such as the United States at levels in excess of 5%, and in Australia at 6%.
4. Of the 264 sample firms, 234 used the method of value in use and 7 applied the mixed method (combination of the value in use and fair value). Table 8 does not consist of two outliers by checking Histogram and Boxplot. Shell Electric Mfg (Holdings) Co., Ltd., client of other auditor, used a single discount rate of 35% and Uni-Bio Science Group Ltd., client of other auditor, applied a range of

discount rates between 35% and 52%.

5. Table 9 does not include the outliers by checking Histogram and Boxplot. Specifically, Uni-Bio Science Group Ltd., client of other auditor, used a single growth rate of 185%. Super Summit International Timber Co., Ltd, client of other auditor, applied a single growth rate of 32%. Hi Sun Technology (China) Ltd., client of PWC, used a range of growth rates between 15% and 45%. Wasion Meters Group Ltd, client of KPMG, applied a single growth rate of 22.4%.
6. Mean forecast period in Table 9 does not consist of two outliers. Public Financial Holdings Ltd., client of E&Y, applied a single forecast period of 50 years. Tianjin Development Holdings Ltd., client of PWC, used a single forecast period of 40 years.

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