

Full Length Research Paper

Study of earnings management and audit quality

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This paper applies the pooled cross-sectional distribution approach to testify whether Small and Medium Enterprises (SMEs) perform earnings management from 1997 to 2003. The study finds that as the SMEs incurred the minor loss, the earnings was manipulated to slight positive earnings for deficit avoidance and failure embarrassment. This leaping zero earnings thresholds of earnings management behavior was not affected by industry characteristics. Regarding the relationship between the earnings management and audit quality, chi-square tests are used. The goal of earnings management crossing the zero earnings thresholds triggered the intention of audit service prepared by the low audit quality Certified Public Accountants (CPAs).

Key words: Small business accounting, earnings management, audit quality.

INTRODUCTION

The small and medium enterprises (SMEs) have played important role to enhance and maintain the economics of the concrete foundation (Mole et al., 2004; Locke, 2006). Both in Europe and U.S., SMEs employ the majority of labor force (Mulhern, 1995; Gregory et al., 2005). According to official statistics, SMEs contributed two thirds of the workforce in Taiwan. Various SMEs growth studies concentrate on the capital structure decision since the capital generating and financing are the major challenges of SMEs (Landstrom, 1995; Abor and Biekpe, 2007). The inherent characteristic of SMEs including family control operation, resource constraints, and lack of information transparency mitigate the reliable financial information (Briscoe et al., 2005; Bartholomeusz and Tanewski, 2006). The reliance on private markets limits the types of financing they can receive (Gregory et al., 2005). The financial institutions mostly rely on collateral (Tagoe et al., 2005).

Although, the authority continues to develop financing improvement system, costly record keeping, burdensome reporting, high transaction costs, risks related to loans, and lack of collateral restrict SMEs access to formal credit (Maingot and Zegbal, 2006). The Ministry of Finance in Taiwan requires the SMEs to present audited financial

reports for loan over \$30 million New Taiwan dollars (NTD). Unqualified audit report (the so-called clean report) is important to obtain the limited capital as well as sufficient collateral for SMEs.

The purposes of the financial statement are to facilitate users to comprehend the business operation and support the credit policy decision makings. The information asymmetry between managers and potential investors provides managers with incentives to influence investor estimates of firm value by managing reported earnings (Richardson, 2000; Jain et al., 2005). The accounting choice for the earnings manipulation is to influence and deceive the decision makings of interested parties (Huang and Lin, 2007). Past research indicates various motivations of earnings management. The relevance of the financial report is reduced and the reliability of the financial statement is impaired as well (Palepu et al., 2004). The audit quality affects the reliability of the financial statements (Kim and Yi, 2009). Becker et al. (1998) finds the high audit quality auditors possessing better professional competency. They can effectively detect the problems and not compromise the client pressure to selective accounting choices. The high audit quality certified public accountant (CPA) firms based on long-term brand and reputation and might not incline to earnings management manipulation. Various studies indicate the high audit quality CPA firms would mitigate the earnings management (Francis et al., 1999; Bauwhede et

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al., 2003; Zhou and Elder, 2004; Chen et al., 2005; Van Tendeloo and Vanstraelen, 2008; Francis and Yu, 2009; Lin and Huang, 2010; Jordan et al., 2010).

However, the earnings management is common (Burgstahler and Eames, 2003). Most studies focus on public companies due to unveiling SMEs information. The window dressing financial report and accounting earnings management are affected by the company sizes (Gosman, 1973; Watts and Zimmerman, 1986) and the separation degree of the operation rights and ownership (Dhaliwal et al., 1982). The earnings management incurrence of public companies applying to SMEs is scant and worth to discuss. This research first investigates whether there was incurred earnings management in SMEs. Then, the study tests the impact from the audit quality to the earnings management. Based on research findings, as the SMEs incurred the minor loss, the earnings were manipulated to slight positive earnings for deficit avoidance and failure embarrassment. The leaping zero earnings thresholds of earnings management behaviors were not influenced by the industry characteristics. However, the service industry compared to peers lacking the earnings manipulator, it is hard to maneuver the negative earnings upward as well. Pertaining to the audit quality relationship, the goal of earnings management to exceed the thresholds motivated the SMEs to approach low audit quality CPAs to dress their report.

The study contributes to the literature in at least three ways. First, the empirical results serve the references of the financial institution financing decision analysis of SMEs regarding the earnings management and audit quality. The earnings management impairs the financial statement quality and affects the financial institution loan decision. Mitigating the risks, it is imperative and meaningful to examine the effects of earnings management and audit quality issues. When the users of the financial report found the accounting alteration due to the earnings management, they are unable to accuse the wrongdoing of the business directly. The authority solely establish the regulation but unable to forbid the earnings management manipulation (Palepu et al., 2004). The financial institution needs to undo the financial information to justify the application.

Second, the study provides evidence for the policy makers to establish a sounding accounting reporting mechanism for SMEs to enhance report quality. The New Basel capital adequacy accord has imposed significant modification for risk weigh. The scarcity of credit rating for SMEs would jeopardize the financing opportunity. As the financial institutions tighten the SMEs credit, the authorities need to implement a range of policy initiatives and facilitate the SMEs accounting system and capital generating channel. Third, the study applies chi-square statistics to measure the impacts from the earnings management motivation to audit quality. The study conducts the threshold histograms approach to examine the linkage between earnings management intention and audit

quality. The results fill the anecdotal scant gap in the accrual earnings management research in financial market.

LITERATURE REVIEW AND HYPOTHESES DEVELOPMENT

Earnings management

Accounting standards allow for managerial discretion in the application of accounting methods used to report firm performance. When this discretion is used with the intent to manipulate reported results, it is called earnings management (Riahi-Belkaoui, 2004; Nigrini, 2005). Growing anecdotal and systematic evidence supporting the argument that earnings management is a common practice in firms (Richardson, 2000; Burgstahler and Eames, 2003).

The earnings management is considered as imperative issue in literature and defined as the managers using the information asymmetry to intervene the financial statement preparation within legal scope and flexibility of GAAP (Degeorge et al., 1999; Burgstahler and Eames, 2003). The managers purposely select preferred accounting policy or arranged transactions to accomplish the business anticipations. Healy and Wahlen (1999) advocated the management applying the flexibility of financial report, designated accounting, and intended deals to modify the earnings of the financial statement. They try to misrepresent the perception of the operation performance for the interested parties. Or they design to influence the financial reporting figures to satisfy the manipulator self-benefits.

Whether the business conducts the earnings management is an imperative issue among the authority, practices, and academics (Dechow and Skinner, 2000). Healy and Wahlen (1999) state that the researchers need to identify the motivation of earnings management to assure the reliability of financial reports. Under the framework of the positive accounting theory, the earnings management is derived from three hypotheses perspectives:

1. Bonus plan.
2. Debt covenant.
3. Political cost.

McNichols (2000) classifies three common research designs related to the earnings management:

1. Aggregate accruals.
2. Specific accruals.
3. Earnings distribution.

The aggregate accruals models are to characterize discretionary behavior while the specific accruals are likely to identify the nondiscretionary and discretionary behavior of

accruals as well. The earnings management distribution developed by Burgstahler and Dichev (1997) and DeGeorge et al. (1999) along with the specific accruals make strong predictions about the behavior of earnings in narrow intervals around a target earnings number and find compelling evidence that earnings are managed to achieve earnings targets, particularly positive earnings (McNichols, 2000). The histograms of scaled net income and changes in net income exhibit discontinuities around zero with a disproportionately low frequency in the partition immediately to the left of zero and a disproportionately high frequency in the partition which includes zero. They attribute these findings to earnings management by firms to meet earnings thresholds of zero earnings and the previous period's earnings (Hayn, 1995; Burgstahler and Dichev, 1997). Various studies applied earnings thresholds to explore the earnings management.

Burgstahler and Dichev (1997) and DeGeorge et al. (1999) advocated that salience of thresholds arises from three psychological effects:

1. Exceeding the zero threshold on absolute earnings.
2. Prospect theory.
3. Transaction cost.

Regarding the absolute earnings, the positive or negative numbers in human thought processes and consideration affecting the earnings greater than zero sustaining has transformed into psychological thresholds. When the earnings reveal minor loss, the threshold mentality triggers the business artificially modifying the earnings to slight gain. The feeling of operation negligence due to negative earnings and the needed explanation for the poor performance embarrassment would be avoided. The psychological thresholds of zero earnings derived from the absolute earnings trigger managers to defeat.

The prospect theory is originated from Kahneman and Tversky (1979) as an alternative method of explaining choices made by individuals under conditions of risks. The reference point is critical for value function, deciding a risk-avertor or a risk-lover. The amount of shifting can dramatically affect choices for two reasons:

1. There is a kink in the utility function at the reference point (zero change).
2. The overall curve is S-shaped which is convex under losses and concave under gains.

If the references of executives, the boards that review them or the investors who trade the stocks are consistent with the predictions of prospect theory. Then the executives would have a threshold-related reward schedule and are likely to manage reported earnings in response. The thresholds they wish to reach are the reference points in the value functions of the participants; such points are likely to be perceptually salient.

Coase (1937) started the discussion of the transaction

cost which incurred in making an economic exchange, various transaction costs including: search and information cost, bargaining cost, and policing and enforcement cost. The transaction cost would be decreased by the earnings thresholds presence effectively. Banks may grant loans only to business that report positive earnings and use a threshold of zero earnings as an initial screen since judiciously adjusting interest rates in response to differential performance may be too hard. Earnings management crossing thresholds can also simplify executives' relations with shareholders and boards of directors. The board continuance, manager resignation, selling or buying securities from financial analysts, and credit rating all apply the earnings threshold to evaluate the business viability and profitability. The information cost feedback model of Conlisk (1996) is similar to the transaction cost notion.

The debt/equity hypothesis assumes to harmonize the interest conflicts among the shareholders and creditors. During the loaning duration, banks would require the net income or some specific ratios above definite level. Otherwise, the liabilities are considered promptly due to protect the creditors. The financial ratio levels force from the debt contract formulating the financial performance threshold. The earnings also serve as the references of loan amounts and interest rate. Facing the contract ceasing pressure and maintaining certain financial ratio level, the company has motivation to raise the book earnings and increase the retained earnings for dividend distribution by selective accounting methods. The business would take action to mitigate the contract termination and default cost (Bowen et al., 1981; Watts and Zimmerman, 1986). When the company has higher liability ratios, there are more constraints and difficulties derived from the loans contracts. Therefore, the managers have incentive to choose the favorable accounting methods for promoting earnings (DeAngelo et al., 1994).

Burgstahler and Dichev (1997) examined 64,466 deflated annual earnings changes observations and 75,999 deflated annual earnings observations from 1976 to 1994. The study results indicated that the company conducted earnings management to avoid the threshold of earnings decreasing and loss. Hayn (1995) suggested that the business would avoid reported loss, conduct the earnings management, and cross over the zero earnings thresholds. Bowen et al. (1995) also indicate the earnings information influenced the interest parties' transactions and favorable to high earnings. For higher earnings business, valuable employees prefer to stay while the creditors opt to provide better financing alternatives.

Financing needs are major reasons and motivations for earnings management of SMEs. The study evaluates the data from the SMEs required audit reports from the Ministry of Finance. Earnings management is to avoid reporting losses and earnings decreases. Exceeding the earnings thresholds enable to simplify the business and interested party relationship, lower the transaction cost,

present positive operation, and obtain the financing from the institutions. Therefore, the study anticipates the SMEs would conduct the earnings management either reaching or leaping the zero earnings thresholds under the financing motivation and pressure. The study proposes the following research hypothesis:

H₁: SMEs perform the exceeding zero earnings thresholds earnings management.

Audit quality impact to earnings management

DeAngelo (1981) introduces a two-dimensional definition of audit quality that set the standard for addressing the critical issue. The material misstatement of the client's accounting system must be detected and reported. The audit quality is imperative to reporting integrity and earnings quality. Especially nowadays, the credibility of the external financial reporting process has been severely challenged by high-profile audit failures, material misstatements, and restatements of financial reports. The audit quality indicates as the capacity of external audits to detect material misstatements and improprieties (Kane and Velury, 2005).

In addition, audit quality conveys the company value. When the manager has confidence about the business and financial report, they expect to explicitly exhibit the true value of the company through the audit quality. They have incentive to hire high audit quality auditor to certify their report (Titman and Trueman, 1986). Blackwell et al. (1998) analyze the relationship between CPA auditing and credit interest rates to explore the auditing to company value. They find the lower interest rate of audited company compared to the un-audited ones. Therefore, the audit service mitigates the benefit inconsistency between the business and creditor.

Abundant research indicates higher audit quality mitigates the earnings management (Becker et al., 1998; Francis et al., 1999; Bauwhede et al., 2003; Zhou and Elder, 2004; Chen et al., 2005; Van Tendeloo and Vanstraelen, 2008; Francis and Yu, 2009; Lin and Huang, 2010; Jordan et al., 2010). The credit of earnings information is also influenced. CPAs would like to avoid the litigation, they judge the adequacy of the accounting principles by the clients' litigation risks (Becker et al. 1998). They apply the Big-Six (now Big-Four) and non-Big-Six (now non-Big-Four) as the audit quality proxy variable and assume the non-Big-Six clients would adopt more earnings accrual items than the Big-Six ones. They find the discretionary accrual items of the non-Big-Six CPA firms (low audit quality) audited companies are all larger than the Big-Six CPA firms (high audit quality) audited companies. The low audit quality CPA firms allow more earnings management to favor their client. The presumption of the CPA firm selection would affect the clients earnings management is supported (Becker et al., 1998).

Francis et al. (1999) suggest that the audited reports by Big-Six CPA firms were considered as high audit quality and observed the effect from the audit quality difference to the earnings management. The results indicate that the audited clients by the Big-Six CPA firms had fewer earnings management than the non-Big-Six CPA firms. Therefore, the high audit quality enables to reduce the earnings management. Zhou and Elder (2004) conducted 2,453 observations of the seasoned equity offerings (SEOs) from 1991 to 1999. They explored the relationship among the SEOs, audit quality, industry experts, and earnings management. The earnings management and audit quality are measured by the CPA firm sizes and discretionary accrual items. The study results indicate that the Big-Five presenting lower earnings management at the prior one year, current, and post one year periods of SEOs. Summarizing the above, the audit quality enables to reduce the earnings management of SEOs. Chen et al. (2005) examine 367 initial public offer (IPO) companies from 1999 to 2002 to explore the IPO audit quality (Big-Five vs. non-Big-Five) and earnings management (by discretionary accruals items measurement). They find the Big-Five audited IPO companies revealed less earnings management in IPO year.

To solve the problems derived from the information asymmetry between the financial report preparers and users, the authority requires the SMEs to obtain CPAs audited financial reports. The professional, creditworthy, and independent CPAs perform audit assurance to strengthen the financial report reliability. Nevertheless, audit quality affects the reliability of the audit report as well as earnings management. Therefore, the study assumes that the high audit quality can reduce earnings management. In this study it was anticipated that SMEs leaping the zero earnings thresholds of the earnings management goal and preferring the low audit quality CPAs for financing audit services. The study proposes the following research hypothesis:

H₂: SMEs approach to low audit quality CPAs for exceeding the earnings thresholds.

STUDY METHOD

Measure of earnings management

The study applies the pooled cross-sectional distribution approach (Burgstahler and Dichev, 1997; Degeorge et al., 1999) to testify whether the SMEs perform the exceeding zero earnings thresholds earnings management. The earnings distribution histograms without earnings management would demonstrate a convex distribution. If there is a discontinuity in the histograms, there is earnings management incurrence. When the actual earnings are negative and close to zero, the business has incentive to perform earnings management which managed the earning to cross over the zero thresholds. Degeorge et al. (1999) claimed "zero" as the threshold of earnings management. Since there are only minor negative earnings, it is not difficult to manipulate the earnings from negative to above zero. After the earnings management slightly under the

zero thresholds observations are lesser than expected. The slightly above the zero threshold observations are greater than expected. The both sides of the thresholds reveal asymmetric and abnormal discontinuity (Jacob and Jorgensen, 2007).

In order to examine the thresholds discontinuity, the study applies the Z test of Burgstahler and Dichev (1997) and t-value test of DeGeorge et al. (1999) to evaluate whether the histogram intensity demonstrating the discontinuity. The Z statistical test of Burgstahler and Dichev (1997) is shown as follows:

$$Z = \frac{AQ_i - EQ_i}{SD_i} \dots\dots\dots (1)$$

Where, AQ_i : The actual company numbers in the i^{th} area, EQ_i : The virtual expected company numbers in the i^{th} area, that's the average numbers of the actual company between $i-1^{th}$ area and $i+1^{th}$ area, SD_i : The standard deviation of the actual company numbers in the i^{th} area.

The statistical formula of t is shown as follows. If the absolute value of the t statistic is greater than 2, there is discontinuity in the intensity.

$$\tau_i = \frac{\Delta p_i - MEAN(\Delta p_i)}{STD(\Delta p_i)} \dots\dots\dots (2)$$

Where, p_i : the ratio of the actual company numbers in the i^{th} area relative to the total observations value, p_{i-1} : the ratio of the actual company numbers in the $i-1^{th}$ area relative to the total observations value, Δp_i : the difference between the actual company numbers in the i^{th} area and the actual company numbers in the $i-1^{th}$ area, $MEAN(\Delta p_i)$: the differential means of the relative quantity for the before and after 5 groups samples in the i^{th} area, $STD(\Delta p_i)$: the standard deviation of the relative quantity for the before and after 5 groups samples in the i^{th} area.

Measure of the audit quality impact to earnings management

DeAngelo (1981) claims the CPA firm size as appropriate proxy of the audit quality and several studies apply (Francis and Wilson, 1988; Knapp, 1991; DeFond, 1992). The study uses the Big-Four and non-Big-Four as high and low audit quality proxy variables to testify the relationship between the audit quality and SMEs earnings management. Based on the observations of the zero earnings thresholds scales, it develops the contingency table of Chi-square measure the ratio between the Big-Four audited and non-Big-Four audited and total samples by the Big-Four audited and non-Big-Four audited to verify the SMEs whether they perform the earnings management and prefer low audit quality CPA firms for financial audit service in order to cross over the zero earnings thresholds.

Data

The study targets the SMEs which qualified the criteria of the authority and loaned over \$30 million NTD. It collects 40,384 data from a secured and nonpublic organization. In this data, there is no individual characteristic identified but only industry level without firm's identification. The financial information is only available from 1997 to 2003 in terms of net income, capital, and CPA selection. Due to the different operation risks and business environment for each industry, the study categorizes the sample as seven industry groups, including: food/ textile, petroleum/ plastic, hardware/ machinery, electronic/ electrical engineering, construction, wholesale/

wholesale/ retail, and service.

EMPIRICAL STUDY RESULTS

Zero-earnings thresholds test

Table 1 presents the descriptive statistics of annual earnings per share (EPS) of SMEs from 1997 to 2003. There are 40,384 observations in this study. The means of EPS for 2001 and 2002 are -0.225 and -0.212. The data for rest years are positive but less or close to one dollar, the highest figure is 1.002 in 2003. The mean of EPS in the total samples is \$0.3 dollar. The medians of annual EPS are positive also indicated the earnings generally positive for total samples. The study categorizes the industry according to the official standard industrial classification system into seven groups. Table 1 also presents the descriptive statistics for each EPS in industry group. For manufacturing industry, the total mean of EPS is 0.439. The means of EPS in the sub-groups are from 0.125 to 0.747, especially the petroleum/ plastic which is the the highest. According to the median information, half of the businesses generate positive earnings. The construction performs the worst performance, the mean of EPS is -0.357, revealing minor loss. The median is 0.083 exhibiting half of businesses maintain positive gain. The mean of EPS is 0.48 and median is 0.185 for wholesale/retail. The mean of EPS for service industry is 0.129 and median is the worst -0.282, revealing half of the service industry could not sustain.

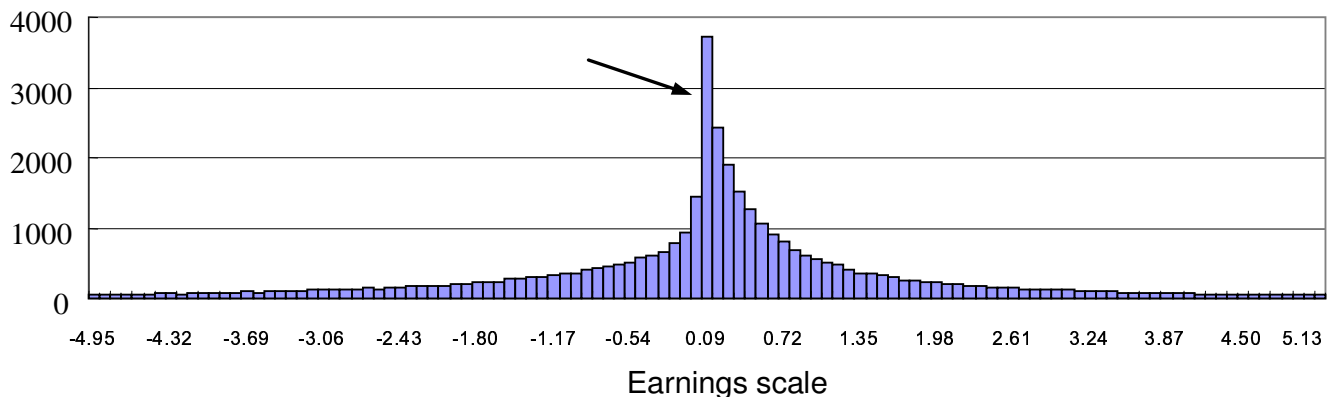
Figure 1 demonstrates the histograms of EPS for the total samples, exhibiting whether the business conducting the earnings management which crossed the zero earnings thresholds and maintained the positive earnings. The 0 scale indicates the EPS is from -0.09 to 0 annual value, a minor loss status for 1,434 observations which was 3.6% of the total samples. The 0.09 scale is the EPS between 0 and 0.09 annual value, crossing the zero earnings threshold and revealing the slight gain companies for 3,718 observations which is 9.2% of the total samples. Based on Figure 1 there is asymmetry for both sides. According to the first right side of the 0 scale in the histogram, there are more observations in 0.09 scales, revealing the discontinuity.

Table 2 presents the earnings threshold test results. After the t value statistic test, the study confirms there was discountinuity in the 0-0.09 scale intensity of the histogram. The Z value is 27.63 and t value is 5.03 greater than 2. Through the histogram demonstration, there are more companies slightly over zero earnings and lesser companies minor below zero earnings. The distribution of the zero earnings thresholds exhibits asymmetry status. There is discontinuity phenomenon close to zero earnings thresholds distribution intensity. The results support the first research hypothesis. When there incurs minor negative earnings, the SMEs would conduct the earnings management. The motivations of crossing the

Table 1. Descriptive statistics for SMEs EPS in New Taiwan Dollars (NTD).

	Observation	Mean	Std. deviation	Q1	Median	Q3
Total samples	40,384	0.300	3.774	-0.706	0.105	0.807
Year						
1997	3,786	0.265	1.328	-0.356	0.175	0.919
1998	4,405	0.584	0.956	-0.588	0.160	1.067
1999	5,930	0.953	8.132	-0.814	0.095	0.806
2000	6,739	0.036	1.781	-0.782	0.101	0.814
2001	6,902	-0.225	1.289	-0.869	0.086	0.781
2002	6,970	-0.212	1.684	-0.815	0.063	0.642
2003	5,652	1.002	4.604	-0.551	0.115	0.807
Industry ^a						
Manufacturing	15,346	0.439	0.589	-0.155	0.233	0.968
Food/textile	3,944	0.125	0.701	-0.233	0.159	0.718
Petroleum/plastic	2,503	0.747	0.847	-0.029	0.280	1.072
Hardware/mechanics	4,660	0.536	0.369	-0.029	0.275	1.036
Electronic/electrical engineering	4,239	0.444	0.474	-0.420	0.236	1.111
Construction	2,856	-0.357	0.920	-0.415	0.083	0.566
Wholesale/ retail	10,063	0.480	1.400	-0.264	0.185	0.931
Service	11,787	0.129	6.817	-1.829	-0.282	0.441

^aThere are 332 observations for the rest industries. Due to the few samples reason, they are deleted.

**Figure 1.** Histogram of EPS: Total observations.

crossing the zero earnings psychological thresholds and avoiding operation deficit drawback trigger the SMEs to manipulate the minor loss into slight gains.

Figure 2 demonstrates the earnings histograms for each industry, based on the 0.1 or 0.2 scales, each industry histogram exhibiting discontinuity for both sides. Although, there are different industries, the right side of 0 which is the first scale in the histogram surges more observations for slight positive earnings. The histograms present skewed shape consequence. The food/ textile, petroleum/ plastic, hardware/ machinery, electronic/ electrical engineering, construction, and wholesale/ retail

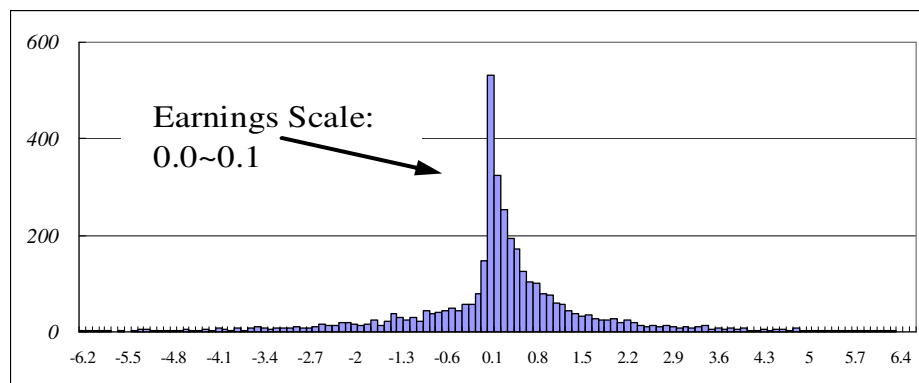
all exceed 10% observation in the scale for 13.5, 18.8, 11.7, 15.5, 14.8, and 11.9%. There is 8.6% observation for service industry Figures 2a to g.

Table 3 lists the earnings thresholds of the Z and t statistics test for each industry. Except the service industry, the t values of the zero earnings threshold for the rest industries are greater than 2. Although, there are different performances for each industry, there are crossing the zero earnings psychological thresholds and generally incline to manipulate the minor negative earnings upward. For service industry, there are surging observations in the minor negative earnings in the -0.2 to

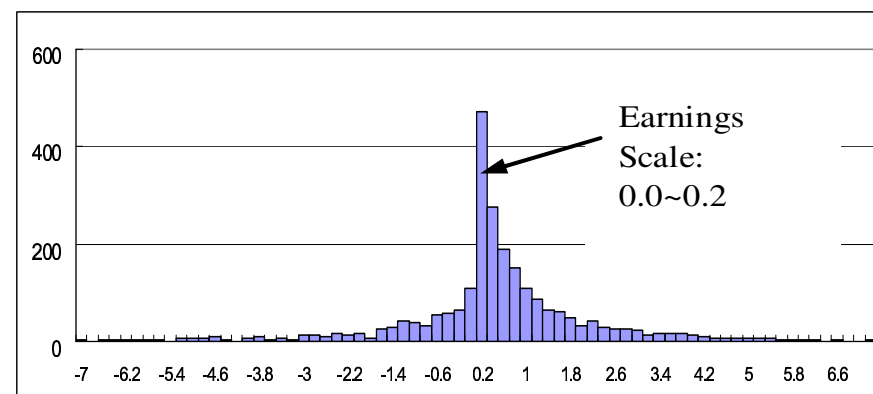
Table 2. Results of zero earning threshold test.

Scale	-0.09 to 0.00	0.00 to 0.09	0.09 to 0.18
Observation	1,434	3,718	2,431
Sample percentage ^a	3.0	9.2	6.0
Z value	-18.394***	27.630***	-6.559***
t value	0.517	5.030***	-1.798

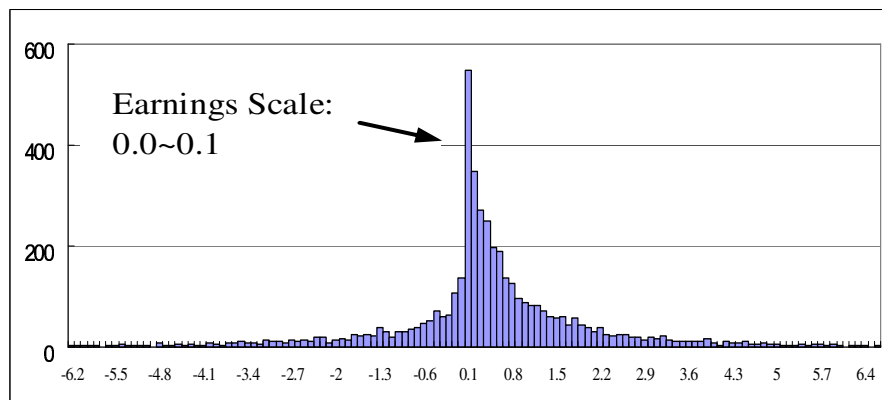
^aSample percentage is the numbers of the observation in the scale to the total samples (40,384).***if the value is over 2 presenting significant at 1% level.



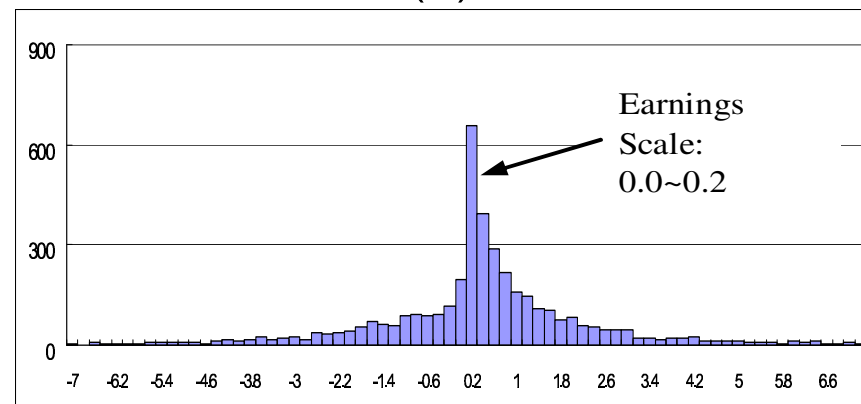
(a)



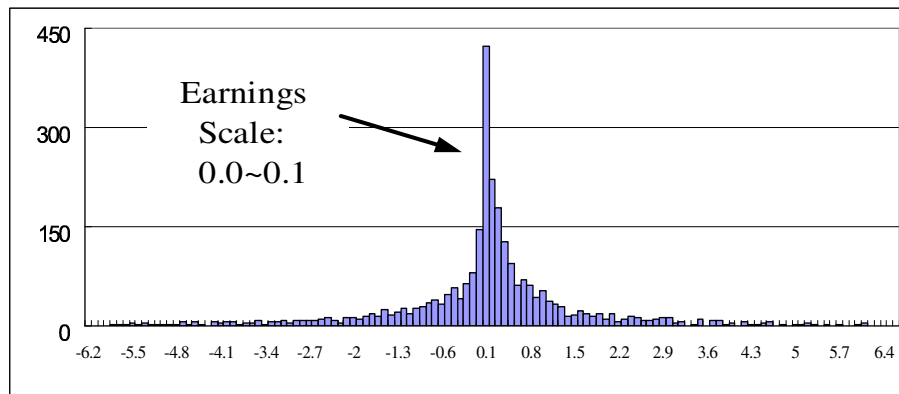
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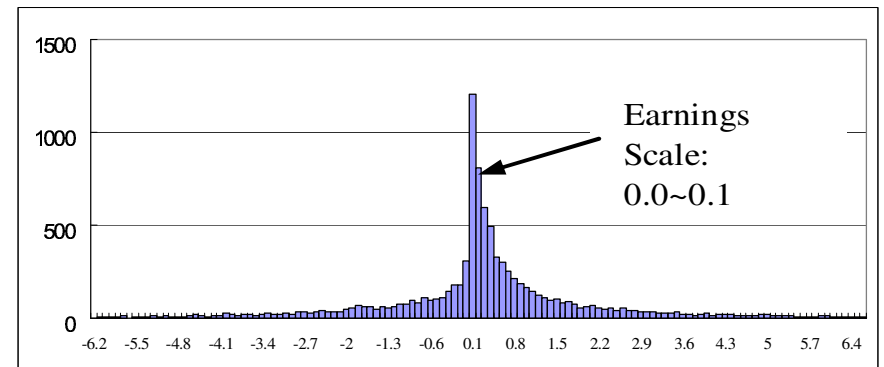
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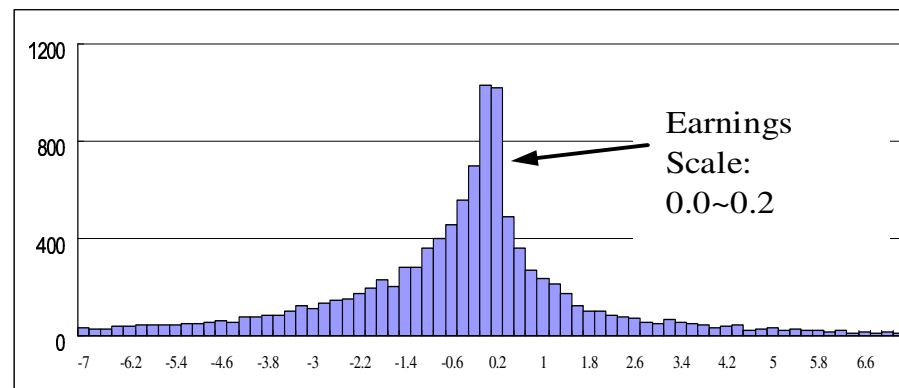
(d)



(e)



(f)



(g)

Figure 2. (a) Food and textile industries (Earning scale 0.1); (b) Petroleum and plastic industries (Earning scale 0.2); (c) Hardware/ mechanical industries (Earning scale 0.1); (d) Electronic/ electrical engineering industries (Earning scale 0.2); (e) Construction industry (Earning scale 0.1); (f) Wholesale / retail industries (Earning scale 0.1); (g) Service industry (Earning scale 0.2).

0 scale (Z value is 4.596 and t value is 1.94 close to 2). There reveal minor loss companies more than expected. Although, there are 8.6% observations located in the 0 to 0.2 zero earnings thresholds,

the t value is only -0.013. Unlike the other industries possess the inventory which have the earnings manipulating weapons or methods, the service industry is unable to conduct the earnings

management easily. Therefore, the goal of the earnings management is either minor loss or slight gain. The test scales are between 0.2 to 0.4 with Z value -6.996 and t value -4.11 validate and

Table 3. Results of zero earning threshold test: Seven industries.

Industry	Test scale*	-0.1-0.0	0.0-0.1	0.1-0.2
Food/textile	Observation	148	531	325
	% a	3.75	13.46	8.24
	Z	-9.151***	11.716***	-3.043***
	t	0.424	5.555***	-1.758
Petroleum/ plastics	Observation	108	471	277
	%	4.31	18.82	11.07
	Z	-10.302***	11.760***	-2.557
	t	0.294	5.795***	-1.731
Hardware/ machinery	Observation	139	545	347
	%	2.98	11.70	7.45
	Z	-11.068***	11.901***	-2.678***
	t	0.151	6.165***	-1.623
Electronic/ electrical engineering	Observation	197	656	391
	%	4.65	15.48	9.22
	Z	-9.650***	12.838***	-3.154***
	t	0.427	5.281***	-1.832
Construction	Observation	146	422	222
	%	5.11	14.78	7.77
	Z	-6.452***	10.586***	-4.088***
	t	0.557	4.268***	-2.293***
Wholesale/ retail	Observation	309	1,199	809
	%	3.07	11.91	8.04
	Z	-15.164***	17.133***	-2.735***
	t	0.361	6.297***	-1.427
Service	Observation	1033	1017	491
	%	8.76	8.63	4.17
	Z	4.596***	6.973***	-6.996***
	t	1.941	-0.013	-4.11***

*For petroleum/plastic, electronic/electrical engineering, and service industries, the test scales are 0.2.a : Sample percentage is the numbers of the observation in the scale to the industry samples.***: if the value is over 2 presenting significant at 1% level.

support the lesser anticipated observations values.

Test of audit quality Impact to earnings management

The study testifies 40,384 SMEs data from 1997 to 2003 and presents the industrial descriptive statistics for the high and low audit quality in Table 4. According to Table 4, the percentages of high and low audit quality for SMEs are 0.171 and 0.829. There are 80% for SMEs inclined to seek for low audit quality in financing audit service. SMEs with earnings manipulation motivation inclined to look for low audit quality CPAs for financing audit service and

crossing the zero earnings thresholds.

Figure 3 presents the distribution for the earnings and audit quality. Regarding the SMEs, the business with regular gains prefers to approach non-Big-Four compared with better and worse peers. Pertaining to the public companies, the business suffering most loss inclines to Big-Four. Regardless SMEs and public companies, there are greater amounts close to zero earnings threshold with non-Big-Four favor.

Table 5 lists the chi-square test for audit quality and earnings management. At the scale between 0 and 0.9, the actual quantities reach the highest for high and low audit qualities are 283 and 3,435 respectively. It is obvious

Table 4. Descriptive statistics of audit quality.

Variable	SMEs		
	n	HQ	LQ
Total Sample	40,384	0.171	0.829
Year			
1997	3,786	0.148	0.852
1998	4,405	0.151	0.849
1999	5,930	0.154	0.846
2000	6,739	0.166	0.834
2001	6,902	0.180	0.820
2002	6,970	0.196	0.804
2003	5,652	0.186	0.814
Industry			
Food/textile	3,944	0.087	0.913
Petroleum/ plastic	2,503	0.159	0.841
Hardware/ machinery	4,660	0.108	0.892
Electronic/ electrical engineering	4,239	0.240	0.760
Construction	2,856	0.130	0.870
Wholesale/ retail	10,063	0.138	0.862
Service	11,787	0.243	0.757

HQ is the high audit quality (Big-Four CPA firms) ratio, and LQ is the low audit quality (Non-Big-Four CPA firms) ratio.

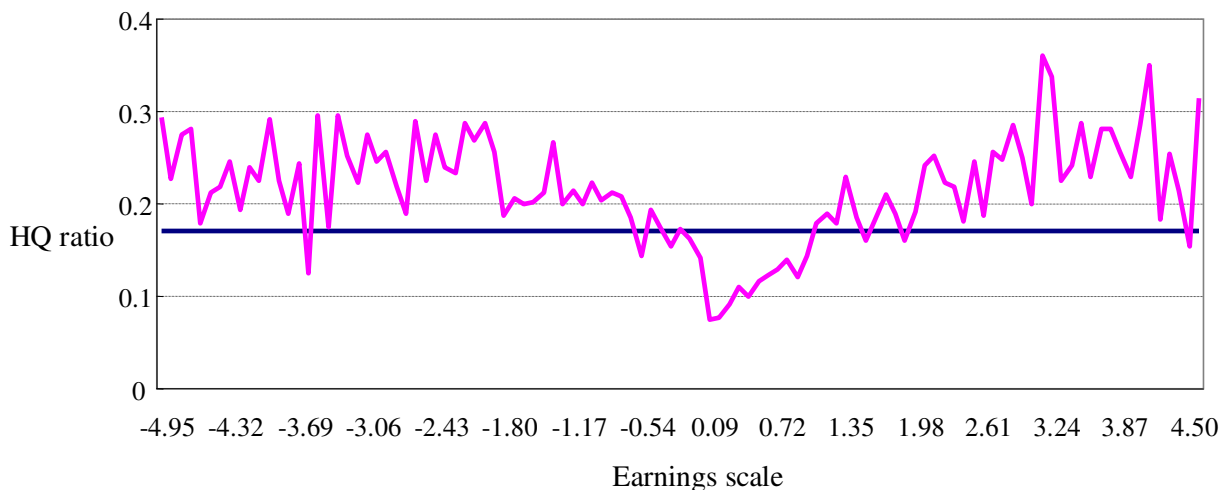


Figure 3. Distribution of the earnings management and audit quality.

Table 5. Chi-square test for audit quality and earnings management.

SMEs	Test scale	-0.09 to 0.00		0.00 to 0.09		0.09 to 0.18	
	observation	E	A	E	A	E	A
Audit quality	HQ	246	204	637	283	417	187
	LQ	1,188	1,230	3,081	3,435	2,014	2,244
	χ^2	8.563***		237.601***		152.734***	

E denotes the expectation value, A denotes the actual value. χ^2 is chi-square value. *** significant at the 1% level.

Table 6. Chi-square test for audit quality and earnings management: Industries.

Industry	Earnings Scale ^a	-0.1 to 0.0		0.0 to 0.1		0.1 to 0.2	
		E	A	E	A	E	A
Food/textile	HQ	13	8	46	17	28	16
	LQ	135	140	485	514	297	309
	χ^2	2.045		20.327***		5.892**	
Petroleum/plastic	HQ	17	14	75	32	44	23
	LQ	91	94	396	439	233	254
	χ^2	0.715		29.408***		12.059***	
Hardware/machinery	HQ	15	9	59	24	37	18
	LQ	124	130	486	521	310	329
	χ^2	2.649		22.884***		11.195***	
Electronic/Electrical Engineering	HQ	47	34	158	58	94	51
	LQ	150	163	498	598	297	340
	χ^2	4.959**		82.972***		25.887***	
Construction	HQ	19	13	55	24	29	13
	LQ	127	133	367	398	193	209
	χ^2	2.157		19.913***		9.997***	
Wholesale/ retail	HQ	43	31	166	60	112	45
	LQ	266	278	1033	1139	697	764
	χ^2	3.762*		78.537***		46.509***	
Service	HQ	251	214	247	196	119	121
	LQ	782	819	770	821	372	370
	χ^2	7.205***		13.877***		0.035	

E denotes the expectation value, A denotes the actual value. For petroleum/plastic, electronic/electrical engineering, and service industries, the test scales are 0.2. Therefore, in the 0.0~0.1 earnings scales among the three industries present 0.0-0.2 χ^2 is chi-square value. *significant at the 10% level; ** significant at the 5% level; *** significant at the 1% level.

obvious that the actual quantity of the low audit quality quantity (3,435) is far exceeding the anticipated 3,081. Through the chi-square test, the value is 237.601 over 1% significant level and critical value 6.635. The study finds that there is relationship between earnings management and audit quality. The actual quantity of low audit quality exceeds the anticipated quantity indicating the scale business inclined to seek for low audit quality CPA for financing audit service. Therefore, the second hypothesis is supported. The study concludes that the low audit quality CPA disable to resist the client's earnings management request and perform the earnings management on behalf of client.

Table 6 describes the chi-square test for each industry and reveals that all the chi-square values all exceeded critical value significantly at the zero earnings threshold. Therefore, there is a relationship between the audit quality and earnings management. The results demonstrate all the low audit quality of the actual quantities exceeding

the anticipated quantities. Under the zero earnings thresholds, the businesses prefer to find low audit quality CPA firms for audit service in order to obtain the earnings manipulation. To summarize the above findings, the motivation of crossing zero thresholds earnings management triggers to ask for low audit quality CPA for financing audit service demonstrated indifference among the industries.

Sensitivity analysis

To evaluate the robustness of the empirical results, the study applies the official monitoring indicator, the light signal announced by the Council for Economic Planning and Development, Executive Yuan, Taiwan to measure the economic cycle. It explores whether the SMEs earnings management is affected by the economic cycle or not. When the overall economic environment is in

recession, the operation performance would be affected. The business is seduced to conduct earnings management. The study applies several related economic cycle additional analyses. First, there is surging at the first scale of the right side thresholds in the histogram. Along with the economic cycle weakens, there are more observations flocking in the small positive earnings. Second, there is crossing over zero earnings companies greater than under zero ones and exhibits discontinuity distribution. Therefore, the business inclines to manipulate the minor negative earnings to slight positive earnings. The crossing the zero earnings psychological thresholds is not affected by the economic cycle. Third, regardless of economic cycle change, all the chi-square reaches the significant level and the actual quantity of low audit quality exceeds the anticipated quantity. The first and second scales of the right side in the zero earnings thresholds also validate the assumption. Therefore, the study concludes that the economic cycle does not affect crossing zero earnings thresholds inclined to low audit quality CPAs for financing audit service.

CONCLUSION AND SUGGESTION

In the study, the samples of SMEs include the loans over \$30 million NTD with the financial institution measured in the pooled cross-sectional distribution approach (Burgstahler and Dichev, 1997; Degeorge et al., 1999). First, the study testifies whether SMEs perform the crossing zero earnings thresholds earnings management behavior in order to satisfy the financing requirement. Second, it uses chi-square test to examine the relationship between the earnings management and audit quality. The SMEs would conduct earnings management in order to maneuver the earnings reaching or over zero. The empirical results find that there is a phenomenon of manipulating the minor negative earnings to slight positive earnings under minor loss situation. The negative earnings would create inferior operation embarrassment and pressure to explain business failure. Because the zero earnings are psychological thresholds for managers, there is a significant discontinuity in the zero earnings threshold histogram.

In addition, the earnings management behavior is neither affected by the industry characteristic nor economic cycle. However, the service industry exhibits earnings management obstruction due to lack of inventory justification and operating difficulty. Although, the earnings management behavior is common in each industry, the differences of the profit situation and manipulating device affect the earnings management fulfillment.

Regarding the relationship between the audit quality and earnings management, the study finds that the companies with earnings management motivation inclined to look for low audit quality CPAs for financing audit service to gain more earnings manipulation. The low audit quality

CPAs are also hard to resist the clients' earnings maneuver. The result of the audit quality seriously affecting the earnings management which is consistent with previous research (Becker et al., 1998; Francis et al., 1999; Bauwhede et al., 2003; Zhou and Elder, 2004; Chen et al., 2005; Van Tendeloo and Vanstraelen, 2008; Francis and Yu, 2009; Lin and Huang, 2010; Jordan et al., 2010). The companies with crossing zero thresholds earnings management motivation would look for the low audit quality CPAs for financing audit service are neither affected by the industry characteristics nor business cycle. The SMEs have a concern in the charge for low audit quality CPAs. Pertaining to the zero earnings thresholds study, the SMEs inclined to ask for low audit quality CPAs are obvious. The empirical study results validate the above notions.

Based on the research results, it is imperative for financial report users to be prudent and rigorous about the business with slight positive earnings in terms of business performance evaluation. The users need to analyze the relevance behind the positive earnings figures and avoid the deceitfulness of earnings management. The audit quality of CPAs is a relevant evaluation indicator for fair report presentation. The policy makers are needed to establish a sounding financial and accounting reporting system and various financing channels to facilitate SMEs in terms of reporting preparation and capital needs. The study presents that the SMEs are common to exhibit the crossing zero threshold earnings manipulation while the service industry focused on either minor loss or slight gain. The study suggests that future researcher may utilize the industry experts to explore the industry difference between manufacturing and service in terms of manipulating technique and consequence.

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