



Impact of Audit Fee Deregulation on Audit-market Competition

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Abstract

In 1998, the audit fee standard was abolished by the Fair Trade Commission of Taiwan. This study aims to investigate the effects of the cancellation of the audit fee standard on audit-market competition of public companies during 1994–2002. The results indicate that after the event, the auditor excess entry rate, auditor excess exit rate and audit-market-share mobility all increased, which is consistent with the prediction of enhanced audit-market competition.

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Keywords: cancellation of audit fee floor, audit-market-share mobility, auditor excess entry rate, auditor excess exit rate

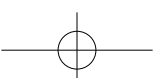
1. Introduction

In the past, Statements 1 and 7 of the Code of Professional Conduct (Ethics) stated that audit fees should be charged above the audit fee standard set by the Taiwan Certified Public Accountants Association (TCPAA). In addition, both Statements prohibited client solicitation by inappropriate price-cutting strategies. In 1998, the Fair Trade Commission of the Executive Yuan in Taiwan determined that the audit fee standard was in violation of the Fair Trade Act. Hence, the public accounting profession was asked to abolish the standard for fair market competition. Accordingly, the long-standing audit fee floor was subsequently abolished.¹

After the abolition of the audit fee standard, rumors of client solicitation through price-cutting strategies prevailed in the profession. Furthermore, four Taiwan

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¹ The audit fee standard regulates the lower bound of audit fee only. Therefore, audit fee floor is synonymous with audit fee standard and used interchangeably throughout this paper.



professional institutions, including certified public accountants (CPAs), attorneys, architects and doctors, have tried to lobby the legislators to resume the establishment of the fee standard but failed due to severe objections from the Fair Trade Commission stating that it is against the global wave of competition (*Economic Daily*, 2001.3.24). Controversy over the audit fee standard therefore remained. In the climate of deregulation on the public accounting profession, this study is motivated to investigate the effect of audit fee floor cancellation on the competition of the audit market.

From the perspective of an industrial organization, when the market is completely competitive, consumers can buy quality goods at the cheapest price and therefore social welfare is maximized. For years academics have been concerned about competition in the audit market. In the late 1970s, the American Staff Study of Congressional Metcalf Subcommittee reported that the audit market lacked competition due to a high concentration of business. To respond to the wave of critiques, authorities around the world modified their regulations on the public accounting profession to foster audit-market competition. The United States of America, for example, lifted the ban on advertising and solicitation by CPAs in 1979. The United Kingdom and Australia followed the same policy in 1980. In the climate of global competition, the Taiwan authority did not take into account the wave of deregulation until 2003, when a major amendment on the Act of CPAs was finally introduced. Accordingly, cancellation of the long-standing audit fee floor signifies a regulatory change to the audit market in Taiwan. It is important and worth investigating the effects of the cancellation of the audit fee floor on competition in the audit market.

In this study, we examine the audit market of public companies and define the client industries as the sub-audit market. During our sampling period of 1994–2002, 278 industry-year observations were obtained. This study uses three market competition indicators, namely excess entry rate, excess exit rate and audit-market-share mobility, to investigate the effects of audit fee floor cancellation on audit-market competition. We define excess entry rate (net increase in the supply of audit service) as the deduction of the client entry rate (increase in the demand for audit service) from the auditor entry rate (increase in the supply of audit service). Similarly, excess exit rate (net decrease in the supply of audit service) is defined as the deduction of the client exit rate (decrease in the demand for audit service) from the auditor exit rate (decrease in the supply of audit service). Empirical results report that both the excess entry rate and excess exit rate increase significantly after the cancellation of the audit fee floor.

In addition to the entry and exit of auditors, audit-market-share mobility is examined. Given constant demand for and supply of audit services, the impact of auditor change on audit-market-share leads to a zero-sum effect, implying that some auditors lose clients and other auditors find new clients. Accordingly, competition becomes more intense when the market-share mobility increases. We find that audit-market-share mobility increases significantly during the period of study. In summary, the evidence above, including excess entry rate, excess exit rate and audit-market-share mobility, documents that the degree of competition in the audit market increases after the cancellation of the audit fee floor.

Regarding audit-market competition indicators, this study extends the indicators of audit-entry and audit-exit used by Buijink, Maijoor and Meuwissen (1998, hereafter

BMM). When the demand for audit service is not controlled properly, it is easy to make an incorrect inference about market competition using the supply-side indicator of entry rate alone, because it is a natural rule that increase in demand will be followed by increase in supply. Accordingly, this study revises the entry rate used by BMM and incorporates the increase in demand and supply at the same time. Then the concept of excess entry rate is developed and measured as the difference between auditor entry rate and client entry rate. When the excess entry rate is positive, it indicates an excess of supply over demand and a competitive market. When the excess entry rate is positive and increasing, it indicates that the extent of supply over demand is augmented and, in turn, market competitiveness is enhanced. In other words, excess entry rate used in this study is a good indicator of the degree of audit-market competition. The rationale above applies to our excess exit rate too. Our findings not only demonstrate the evidence of enhanced competition in the audit market but also enrich the literature of this field.

The remainder of this study is structured as follows. Section 2 reviews relevant studies and develops our hypothesis. Section 3 describes the methodology used. Empirical results and discussion appear in section 4. Additional analyses appear in section 5. Finally, section 6 concludes this study.

2. Literature Review and Hypothesis Development

In this section, we describe the scenario of the cancellation of the audit fee floor (the event). Then a hypothesis is developed from the findings of prior studies.

2.1 Scenario of Cancellation of Audit Fee Floor

In order to set up the criteria for charging audit fees, for years, in Taiwan, Article 34 of the Act of CPAs has required the TCPAA to stipulate an audit fee standard to prevent the impairment of audit quality caused by price-cutting competition. Three categories of audit fee standard are established, including the audit of financial statements, tax attestation, and the audit of corporate capital registration. The audit fee of a financial statements audit is charged by the different total assets bracket of the client. The audit fee of tax attestation is a function of the sales revenue of the client. The audit fee of corporate capital registration is a function of the capital invested or withdrawn. When performing an audit engagement, a member of the TCPAA should not charge fees lower than the standard and will be punished in case of violation.

In 1992, the Executive Yuan established the Fair Trade Commission to administer and investigate anti-competitive behavior in the market. The Fair Trade Commission reviewed the standards of the practicing fee in all of the professional organizations. As to the audit fee standard, the attitude of the Commission was neither rejection nor acceptance. However, the standard of the audit fee caught the attention of the Fair Trade Commission in 1998 when a practicing CPA acquired an engagement to audit the financial statements of Taiwan Fertilizer Company with a bidding price lower than the audit fee floor. The TCPAA required that the CPA should give up the following year's engagement with Taiwan Fertilizer Company for his violation of the audit fee standard.

To counterattack, the CPA made an appeal to the regulators. Both the Fair Trade Commission and the Ministry of Finance stood against the TCPAA. The long-standing audit fee standard was abolished afterwards.

2.2 Hypothesis Development

In America, the Federal Trade Commission and the United States Justice Department investigated anti-competitive behavior in the audit services market in 1977. As a result, the American Institute of Certified Public Accountants modified its professional requirements and lifted the ban on advertising and client solicitation in 1979. Maher et al. (1992) examined the effects of the 1979 deregulation on audit fees and found a significant decrease in real audit fees between 1977 and 1981. Similar events occurred in Australia and the restrictions on advertising were dropped from 1982–1987. Craswell (1992) investigated the change in audit fees before and after this in Australia and also reported a significant decrease in audit fees. Both Maher et al. (1992) and Craswell (1992) are consistent with the viewpoint that cancellation of regulation enhances market competition.

Instead of focusing on changes in audit fees, BMM investigated audit-market competition between the more liberal Dutch audit market and the more regulated German audit market in terms of audit-market-share mobility, audit-firm entry, and audit-firm exit. They posited that the degree of regulation would affect the behavior of market competition.² Their results indicate that the more liberal Dutch audit market, implying more competition in the audit market, has higher audit-market-share mobility, audit-firm entry, and audit-firm exit.

In Canada, section 86 of the Ontario Municipal Act, which governs the appointment of municipal auditors, was amended to require all Ontario municipalities to review the appointment of their auditors periodically. Before the amendment, municipalities could remove the incumbent auditors only for a “just cause”. Accordingly, the amendment to section 86 was undoubtedly made in order to remove the legislative barrier of entering the Ontario audit market. In the deregulation climate, Bandyopadhyay and Kao (2001) investigated the effect of the legislative amendment on the audit market. Empirical results show that there was a general reduction in the post-amendment real municipal audit fees. In addition, they reported corroborative evidence that the ratio of auditor switches, auditor entry rate, auditor exit rate and ratio of open tenders all increased, while market concentration declined post-amendment. In summary, audit-market competition in Canada was enhanced after the removal of the legislative entry barrier.

The aforementioned evidence reveals that the establishment of the audit fee floor limits Taiwan audit-market competition, while cancellation of the audit fee floor will heighten market competition. Accordingly, our hypothesis is stated as follows.

² To qualify as an auditor in Germany requires a minimum of five years of professional experience. In principle, all advertising and the provision of non-audit services are forbidden in Germany. In the Netherlands, all advertising is allowed as long as it complies with professional ethics. Furthermore, there is no professional experience requirement and audit firms are allowed to provide bookkeeping services to audit clients. Accordingly, BMM defined the Dutch audit market as a more liberal market.

H: *Competition in the audit market becomes more intense following the cancellation of the audit fee floor.*

3. Methodology

3.1 Empirical Model

This study exploits excess entry rate, excess exit rate and market-share mobility as indicators of audit-market competition to establish the following three regression models.

$$\left. \begin{array}{l} EENR_{kt} \\ EEXR_{kt} \\ MOB_{kt} \end{array} \right\} = \begin{array}{l} \phi_0 + \phi_1 FLOOR + \phi_2 SPEC_{kt} + \phi_3 ACR3_{kt} \\ + \phi_4 REG_{kt} + \phi_5 CCR4_{kt} + \phi_6 GROWTH_{kt} + \phi_7 MEANSIZE_{kt} + v_{kt} \end{array} \quad (1)$$

where

$k =$	industry;
$t =$	time period;
$EENR =$	excess entry rate;
$EEXR =$	excess exit rate;
$MOB =$	audit-market-share mobility;
$FLOOR =$	cancellation of audit fee floor;
$SPEC =$	the first indicator of industry specialization;
$ACR3 =$	the second indicator of industry specialization;
$REG =$	regulated industry;
$CCR4 =$	industry concentration;
$GROWTH =$	industry in growth;
$MEANSIZE =$	average size of client firms.

ϕ_1 is employed to capture the effect of the cancellation of the audit fee floor. The higher the excess entry rate, excess exit rate and audit-market-share mobility, the more competitive the market is (BMM). Hence, ϕ_1 is expected to be significantly positive in our three empirical models.

3.2 Variable Definitions

3.2.1 Dependent Variables

(1) Excess Entry Rate (EENR)

BMM defined entry rate as the number of audit firms that enter the audit market during the period $t-1$ to t , and deflate the entry rate by the total number of audit firms in the audit market at period t . Their entry rates take into account the increase in the supply side only and neglect the changes in the demand side. In terms of both supply and demand sides, this study modifies their entry rates to show a complete picture of market competition. Accordingly, we propose an excess entry rate and define it as the deduction of the client entry rate from the auditor entry rate. The auditor entry rate denotes an increase in the supply side while the client entry rate measures an increase in the demand side. When the excess entry rate is positive and increasing, it indicates that the extent of supply over demand is augmented and, in turn, market competitiveness is enhanced. Hence, the excess entry rate captures the effects of enhanced competition much better than using the entry rate alone.

Eichenseher and Danos (1981) indicate that auditor concentration and degree of market competition vary between different client industries. Accordingly, we define the audit market as a client industry-specific market. Measurement of excess entry rate is shown as follows

$$EENR_{kt} = \frac{AEN_{kt}}{I_{kt}} - \frac{CEN_{kt}}{\sum_{i=1}^{I_{kt}} J_{ikt}} = ENR - CENR$$

where $EENR_{kt}$ denotes the excess entry rate of industry k at period t ; AEN_{kt} is the number of audit firms that enter industry k during period $t-1$ to t ; I_{kt} is the number of audit firms in industry k at period t ; CEN_{kt} is the number of companies that enter industry k during $t-1$ to t ; and J_{ikt} denotes the number of companies that are audited by accounting firm i in industry k at period t . In short, $EENR$ is defined as the auditor entry rate (ENR) minus the client entry rate ($CENR$).

(2) Excess Exit Rate (EEXR)

Similar to the excess entry rate, the following excess exit rate is adapted from the exit rate used by BMM and is defined as the difference between the client exit rate and the auditor exit rate

$$EEXR_{kt} = \frac{AEX_{kt}}{I_{kt-1}} - \frac{CEX_{kt}}{\sum_{i=1}^{I_{kt-1}} J_{ikt-1}} = EXR - CEXR$$

where $EEXR_{kt}$ denotes the excess exit rate of industry k at period t ; AEX_{kt} is the number of audit firms that exit industry k during $t-1$ to t ; I_{kt} is the number of audit firms in

industry k at period t ; CEX_{kt} is the number of companies that exit industry k during $t-1$ to t ; and J_{ikt} denotes the number of companies that are audited by accounting firm i in industry k at period t . In short, $EEXR$ is defined as the auditor exit rate (EXR) minus the client exit rate ($CEXR$).

(3) Audit-market-share Mobility (MOB)

Market share is generally determined by business volume or amount of revenue. In the audit market, if market share is calculated in terms of revenue, it is dependent on the audit fee. However, when the audit fee is not publicly available, a proxy variable is employed to estimate the market share, but the resulting auditor concentration is prone to be overstated (Tomczyk and Read, 1989). Hence, as shown in the following, this study estimates the market share by business volume (number of clients), consistent with most of the previous studies (for example, Eichenseher and Danos, 1981; Kwon, 1996)

$$IMS_{ikt} = \frac{J_{ikt}}{I_{kt}} \frac{1}{\sum_{i=1}^{I_k} J_{ikt}}$$

Following BMM, we define the extent of audit-market-share mobility as follows

$$MOB_{kt} = \frac{\sum_{i=1}^{I_k} |IMS_{ikt} - IMS_{ikt-1}|}{2}$$

where MOB_{kt} is the extent of audit-market-share mobility in industry k at period t ; IMS_{ikt} is the market share of audit firm i in industry k at period t ; J_{ikt} denotes the number of companies that are audited by audit firm i in industry k at period t ; and I_{kt} is the number of audit firms in industry k at period t .

3.2.2 Experimental Variable

In Taiwan, the long-standing standard of audit fee was abolished in 1998. Hence, $FLOOR$, denoting the cancellation of the audit fee floor, is a dummy variable and is equal to 1 when the time period is after 1998, and 0 otherwise.

3.2.3 Control Variables

Following Kwon (1996) and Hogan and Jeter (1999), this study incorporates five categories of control variable, including industry specialization, regulated industry, industry concentration, industry in growth, and mean size of client firms.

(1) Industry Specialization (*SPEC*, *ACR3*)

It is expected that a higher degree of industry specialization enhances an auditor's ability to react to the increased audit-market competition (Hogan and Jeter, 1999; Kwon, 1996). In turn, this will thwart the entrance of potential competitors, expedite the exit of other incumbent competitors and maintain or expand the auditor's market share. Hence, the coefficients of *SPEC* and *ACR3* are expected to be positive in our three regression models.

Two metrics are frequently employed to measure the auditor's industry specialization. The most popular one is the market share approach, measured by industry-specific market share. The other one, proposed by Yardley et al. (1992) and applied by Kwon (1996), is the portfolio share approach, measured by the percentage of industry-specific revenue to total revenue. Neal and Riley (2004) argued that both approaches possess merits and limitations,³ and suggested that both approaches should be taken into account simultaneously when examining the effects of audit quality/industry specialization. Accordingly, this study incorporates both metrics of industry specialization.⁴

Under the portfolio share approach, the maximum estimates of industry specialization will be 100% when an audit firm has only one client, a result inconsistent with the spirit of industry specialization. Hence, in order to remedy the bias of overstating the degree of industry specialization of a small audit firm, when an audit firm is designated as an industry specialist, the firm must have at least seven clients in that industry. Our lower bound of seven clients follows Craswell et al. (1995).⁵ According to Kwon (1996), under the portfolio share approach, the metric of an industry specialist is as follows

$$SPEC_{kt} = \frac{\sum_{i=1}^{I_{kt}} SPEC_{ikt}}{I_{kt}} \quad \text{and} \quad SPEC_{ikt} = \frac{J_{ikt}}{\sum_{k=1}^{K_t} J_{ikt}}$$

where $SPEC_{kt}$ is the first indicator of industry specialization and measured as the ratio of revenue from industry k to total revenue at time t ; I_{kt} is the number of audit firms in industry k at time t ; J_{ikt} denotes the number of companies that are audited by the audit

³ The market share approach tends to over-identify (under-identify) the number of industrial specialists in a small (large) industry while the portfolio share approach is apt to be driven by the size of an industry. However, the market share approach possesses the advantage of interpreting an industry specialist as an audit firm that has differentiated itself from its competitors within a particular industry. The advantage of the portfolio share approach is that when audit firms are considered as industry specialists, they have presumably devoted significant resources to developing industry-specific audit technologies and expertise.

⁴ To avoid a potential multi-collinearity problem raised by using two specialization measures (*SPEC*, *ACR3*) simultaneously, we run the regression model again with only one specialization measure included. In addition, we use the weighted measure of specialization suggested by Neal and Riley (2004) to retest the regression model. None of the empirical results are materially different from the original ones.

⁵ They established a recognition threshold of industry specialists: 30 companies in an industry and minimum market share of 20%. Thus, the lower bound of number of companies required in this paper is 7, greater than 6 (30*20%).

firm i in industry k at time t ; and K_{it} is the number of industries that audit firm i gets involved with at time t .

Under the market share approach, an industry specialist is defined as the sum of the market share of the three largest audit firms. The metric is adapted from Hogan and Jeter (1999) and shown as follows

$$ACR3_{kt} = \frac{\sum_{i=1}^3 J_{ikt}}{\sum_{i=1}^{I_{kt}} J_{ikt}}$$

where $ACR3_{kt}$ is the second indicator of industry specialization and measured as the sum of the market share of the three largest audit firms in industry k at time t ; I_{kt} is the number of audit firms in industry k at time t ; and J_{ikt} denotes the number of companies that are audited by audit firm i in industry k at time t .

(2) Regulated Industry (*REG*)

When the financial statements of a client industry are prepared with particular prescriptions, auditors need to devote significant resources to develop their own technology and experience and train their employees (Eichenseher and Danos, 1981). Acquisition of professional capabilities and expertise, including industry-specific accounting procedures and regulatory requirements, would reduce the marginal cost of servicing other clients in the same industry. In turn, auditors develop economies of scale to create entry/exit barriers and maintain their market share in the competitive market. Hence, the coefficients of *REG* are expected to be negative in our three regression models. Following this line of prior research, including Eichenseher and Danos (1981), Danos and Eichenseher (1982, 1986) and Hogan and Jeter (1999), this study defines regulated industries as the utilities, land transportation, air transportation, financial and insurance, telecommunications, and broadcasting and programming industries. *REG* is equal to 1 when the industry is regulated, and 0 otherwise.

(3) Client Industry Concentration (*CCR4*)

When the degree of concentration in an industry increases, surviving companies in that industry will be reluctant to use the same auditors because they do not want to risk the transfer of proprietary business information to their competitors (Kwon, 1996). It is thus difficult for auditors to thwart the entry of new competitors. Furthermore, the incumbent auditors will remain in the market. Finally, it is even more difficult for auditors to expand their market share any further. Accordingly, the coefficients on *CCR4* are expected to be positive in the regression model of *EENR* and negative in the remaining two regression models of *EEXR* and *MOB*. Following Kwon (1996) and Hogan and Jeter (1999), this study defines industry concentration as the sum of the market share of the four largest companies in that industry. The notation of *CCR4* is as follows

$$CCRA_{kt} = \frac{\sum_{j=1}^4 Ln(A_{ijkt})}{\sum_{i=1}^{I_{kt}} \sum_{j=1}^{J_{ikt}} Ln(A_{ijkt})}$$

where $CCRA_{kt}$ is the industry concentration of industry k at time t ; $Ln(A_{ijkt})$ is the nature log of total assets of company j audited by audit firm i in industry k at time t ; J_{ikt} denotes the number of companies that are audited by audit firm i in industry k at time t ; and I_{kt} is the number of audit firms in industry k at time t .

(4) Industry in Growth (*GROWTH*)

Auditors are more interested in attracting growing clients and focus their specialization efforts on industries characterized by relatively rapid growth (Hogan and Jeter, 1999). Thus, auditors face more rivals in a growing industry. It is expected that the coefficients on *GROWTH* are positive in our three empirical models. According to Hogan and Jeter (1999), we define an industry as experiencing rapid growth if its mean growth in five-year sales is higher than that of all industries. *GROWTH* is equal to 1 if a client industry is a rapidly growing industry, and 0 otherwise.

(5) Average Size of Client Firms (*MEANSIZE*)

Hogan and Jeter (1999) expected and found that the association between average size of client firms and auditor concentration is positive. Using Hogan and Jeter (1999), the average size of client firms is included as a control variable in the regression model. However, no theoretical expectation exists between the average size of client firms and audit-firm entry, audit-firm exit, and market-share mobility. The expected sign of *MEANSIZE* is indeterminate. The measurement of the average size of client firms is shown as follows

$$MEANSIZE_{kt} = \frac{\sum_{i=1}^{I_{kt}} \sum_{j=1}^{J_{ikt}} Ln(A_{ijkt})}{\sum_{i=1}^{I_{kt}} J_{ikt}}$$

where $MEANSIZE_{kt}$ is the average size of client firms in industry k at time t ; $Ln(A_{ijkt})$ is the nature log of total assets of company j audited by audit firm i in industry k at time t ; J_{ikt} denotes the number of companies that are audited by the audit firm i in industry k at time t ; and I_{kt} is the number of audit firms in industry k at time t .

3.3 Data and Sample Selection

3.3.1 Data

Financial data of both client firms and auditors are obtained from the database of the Taiwan Economic Journal. Data of industry classification are taken from the China Credit Information Service Limited. Industry classification used in the China Credit Information Service Limited is based on Taiwan's Standard Industrial Classification System, published by the Directorate-General of Budget, Accounting and Statistics, Executive Yuan.⁶

3.3.2 Sampling Periods

This study aims to investigate the effects of the cancellation of the audit fee floor in 1998 on audit-market competition. To contrast the effects before and after this event, the sampling periods cover the four years before and after 1998, excluding the event year 1998. Hence, we have the pre-event periods of 1994–1997 and the post-event periods of 1999–2002. To prevent the confusing effects from mergers between auditors, we tackle it by means of retroactive adjustment. That is, if a merger of two auditors occurs, these two auditors are treated as the same entity throughout the sampling periods.

3.3.3 Sample Selection Criteria

All public companies are candidate samples and included as final observations when the following selection criteria are satisfied.

- (1) Non-calendar year companies are deleted to prevent the results from being affected by an inconsistent accounting base.
- (2) Companies without any one of the following data are deleted: industry classification code, financial data, and attestation data of auditors.
- (3) Any industry with fewer than 10 constituent companies is deleted.
- (4) Any industry included must have at least two consecutive years of data to estimate some variables, such as excess entry rate.

The number of industries finally included is 41, and there are 278 industry-year observations.⁷

⁶ The basic structure of Taiwan's Standard Industrial Classification System follows the United Nation's standard industry classification. By referring to the industry classification used in Singapore, North America and Japan, the authoritative agency establishes the Standard Industry Classification on the basis of data obtained from the Taiwan Commerce and Service Industry Census. Consulting with 258 units, including administrative agencies, academics and unions, the Directorate-General of Budget, Accounting and Statistics made a final decision on the standard industry classification after a series of project meetings.

⁷ In this study, industry is used as a basic analyzing unit. A tradeoff between the homogeneity within industry and size of the industry occurred. After examining the sample data, we start with the three-digit SIC code and divide industries with enough observations further using the four-digit SIC code. We use the two-digit SIC code for industries without sufficient observations. So industries were identified by three methods, the two-digit, three-digit, and four-digit SIC codes. Among 41 industries included, 3 were identified by the two-digit SIC code, 28 by the three-digit SIC code, and 10 by the four-digit SIC code.

4. Empirical Results and Analysis

4.1 Descriptive Statistics

Table 1 displays the descriptive statistics of variables. The mean of dependent variable *EENR* is -0.007, implying that the entry rate of the auditor is less than that of the client. In other words, the increase in demand is greater than the increase in supply. Furthermore, zero median of *EENR* indicates that half of the observations are new increases in the demand for audit service over new increases in the supply of audit service. The remaining half of the observations pertains to the reverse condition. Next, the mean of *EEXR* is 0.041, implying that the exit rate of the auditor is greater than that of the client. In other words, the decrease in supply is greater than the decrease in demand. The mean of *MOB* is 0.032, implying that the magnitude of change in the market share of industry-specific auditors is 3.2%. An immaterial difference between the mean (0.032) and median (0.026) of *MOB* indicates that there is no seriously skewed distribution in the variable *MOB*.

Table 1 Descriptive Statistics

	Mean	Std. dev.	Mini.	Quartile			Maxi.
				Q1	Median	Q3	
Dependent variables							
<i>EENR</i>	-0.007	0.088	-0.327	-0.038	0.000	0.044	0.207
<i>EEXR</i>	0.041	0.110	-0.538	-0.012	0.023	0.102	0.425
<i>MOB</i>	0.032	0.032	0.000	0.007	0.026	0.047	0.215
Independent variables							
<i>FLOOR</i>	0.576	0.495					
<i>SPEC</i>	0.006	0.008	0.000	0.000	0.003	0.009	0.039
<i>ACR3</i>	0.579	0.098	0.371	0.506	0.589	0.636	0.846
<i>REG</i>	0.198	0.399					
<i>CCR4</i>	0.141	0.102	0.024	0.064	0.104	0.194	0.434
<i>GROWTH</i>	0.371	0.484					
<i>MEANSIZE</i>	14.395	0.794	12.392	13.898	14.391	14.842	18.206

Notes:

1. Number of observations is 278.
2. Variable definitions:

EENR: excess entry rate = auditor entry rate minus client firm entry rate.

EEXR: excess exit rate = auditor exit rate minus client firm exit rate.

MOB: audit-market-share mobility.

FLOOR: cancellation of audit fee floor = 1 when the time period is after 1998 and 0 otherwise.

SPEC: the first indicator of industry specialization = the ratio of industry-specific revenue to total revenue.

ACR3: the second indicator of industry specialization = sum of the industry-specific market share of the 3 largest audit firms.

- REG*: regulated industry = 1 when the industry whose accounting procedure is regulated and particular in nature and 0 otherwise.
- CCR4*: industry concentration = sum of the industry-specific market share of the 4 largest client firms.
- GROWTH*: industry in growth = 1 if the growth rate of a client industry is higher than that of all industries and 0 otherwise.
- MEANSIZE*: average size of client firms = sum of the nature log of total assets of each company divided by the number of total companies.

The mean of experimental variable *FLOOR* is 0.576, indicating that the number of post-event observations is 57.6% of total observations. The mean, median and maximum of *SPEC* are 0.006, 0.003, and 0.039 respectively, meaning that the ratio of industry-specific revenues to auditor’s total revenues is small, and its maximal ratio is only 3.9%. The mean and median of *ACR3* are 0.579 and 0.589 respectively, and its maximum is 0.849. The results of *ACR3* reveal the high degree of auditor concentration. The mean of *REG* is 0.198, which indicates that the observations with regulated accounting procedures and with particular operating attributes come to about 20% of the total observations. The mean and median of *CCR4* are 0.141 and 0.104 respectively, implying that the degree of industry concentration is low. The mean of *GROWTH* is 0.371, indicating that the observations of growth industries are about 37.1% of total observations. The mean (14.395) and median (14.391) of *MEANSIZE* are similar, indicating that there are no extreme values.

Table 2 presents the correlation coefficients of independent variables. Except for the higher correlation between *SPEC* and *CCR4* (Pearson’s, -0.612; Spearman’s, -0.867), the remaining correlation coefficients are less than 0.4. Regarding the possible multicollinearity caused by the higher correlation between *SPEC* and *CCR4*, we tackle it later using the Variance Inflation Factor (VIF) test. In addition, correlation between independent variables reveals something interesting. For example, the correlation coefficient of *REG* and *ACR3* is 0.198, which implies a higher auditor concentration in the regulated industry with particular accounting prescriptions. Pearson’s correlation coefficient between *REG* and *MEANSIZE* is 0.243, indicating that the mean size of the regulated industry is relatively larger. A positive association between *GROWTH* and two indicators of industry specialization (*SPEC* and *ACR3*) indicates that it is easier for auditors to develop industry specialization in growing industries.

Table 2 Matrix of Correlation Coefficients

	<i>FLOOR</i>	<i>SPEC</i>	<i>ACR3</i>	<i>REG</i>	<i>CCR4</i>	<i>GROWTH</i>	<i>MEANSIZE</i>
<i>FLOOR</i>		0.083 (0.165)	0.256 (0.000)	0.006 (0.917)	-0.158 (0.008)	0.026 (0.667)	0.051 (0.397)
<i>SPEC</i>	0.172 (0.004)		0.047 (0.439)	0.093 (0.122)	-0.612 (0.000)	0.311 (0.000)	0.024 (0.685)
<i>ACR3</i>	0.263 (0.000)	0.007 (0.000)		0.198 (0.001)	0.342 (0.000)	0.300 (0.000)	0.102 (0.091)
<i>REG</i>	0.006 (0.917)	0.023 (0.700)	0.200 (0.001)		0.019 (0.750)	0.105 (0.080)	0.243 (0.000)

<i>CCR4</i>	-0.185 (0.002)	-0.867 (0.000)	0.288 (0.000)	-0.013 (0.829)		-0.089 (0.139)	0.023 (0.707)
<i>GROWTH</i>	0.026 (0.667)	0.206 (0.001)	0.307 (0.000)	0.105 (0.080)	-0.147 (0.014)		-0.079 (0.190)
<i>MEANSIZE</i>	0.043 (0.474)	0.018 (0.760)	0.041 (0.498)	0.148 (0.014)	0.059 (0.329)	-0.112 (0.063)	

Notes:

1. Number of observations is 278.
2. Figures in the upper right triangle are Pearson correlation coefficients while figures in the lower left triangle are Spearman correlation coefficients.
3. Figures in parenthesis are p-value.
4. Variable definitions:

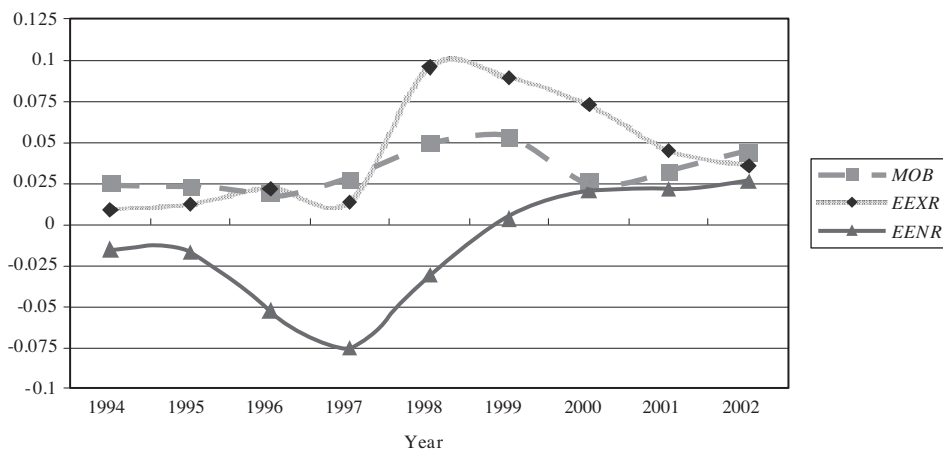
<i>FLOOR</i> :	cancellation of audit fee floor = 1 when the time period is after 1998 and 0 otherwise.
<i>SPEC</i> :	the first indicator of industry specialization = the ratio of industry revenue to total revenue.
<i>ACR3</i> :	the second indicator of industry specialization = sum of the industry-specific market share of the 3 largest audit firms.
<i>REG</i> :	regulated industry = 1 when the industry whose accounting procedure is regulated and particular in nature and 0 otherwise.
<i>CCR4</i> :	industry concentration = sum of the industry-specific market share of the 4 largest client firms.
<i>GROWTH</i> :	industry in growth = 1 if the growth rate of a client industry is higher than that of all industries and 0 otherwise.
<i>MEANSIZE</i> :	average size of client firms = sum of the natural log of total assets of each company divided by the number of total companies.

4.2 Univariate Analysis

Figure 1 depicts the mean trend of audit-market competition indicators. At first, *MOB* remains stable during the pre-event period and begins to rise in the event year of 1998. During the post-event period, all *MOBs* are higher than those during the pre-event period, except in 2000. Next, *EEXR* moves horizontally during the pre-event period and climbs up to the highest point in 1998. Although moving downward after 1998, all of the *EEXRs* during the post-event period are higher than those during the pre-event period. Finally, the trend of *EENR* seems to be slightly in the opposite direction from that of *EEXR*. *EENR* displays a decreasing tendency during the pre-event period but soars up in 1998 and maintains the trend during the post-event period.⁸ The patterns of *MOB*, *EEXR* and *EENR* above tend to increase after the event. This evidence demonstrates that the degree of audit-market competition has been enhanced after the cancellation of the audit fee floor in 1998.

⁸ In 1997, *EENR* drops significantly in that the Taiwan business cycle reached a peak in 1997 and the Taiwan weighted average index (TAIEX) climbed to a historical record of 10,066, in July 1997. The prosperous economy lead to a sharp increase in the number of public companies. Headed by the demand for audit services, supply of audit services therefore increased. As a result, a drastic change of *EENR* was observed in 1997. To assess the impact of 1997 on our results, we performed the regression model again, with the data of 1997 deleted, and the empirical results remain unchanged.

Figure 1 Trends of Indicators of Audit-market Competition



Note: Variable definitions:

EENR: excess entry rate = auditor entry rate minus client entry rate.

EEXR: excess exit rate = auditor exit rate minus client exit rate.

MOB: audit-market-share mobility.

Table 3 reports the testing results of two-sample difference between pre-event period and post-event period indicators of audit-market competition. As shown, the mean of *EENR* is -4.1% during the pre-event period and climbs up to 1.8% during the post-event period. The difference between pre-event *EENR* and post-event *EENR* is significant at the 0.01 level ($t = -5.65$). Next, during the pre-event period, the mean of *EEXR* is 1.4% and increases to 6.1% during the post-event period. The difference between pre-event and post-event *EEXR* is significant at the 0.01 level ($t = -3.71$). Finally, the difference between pre- and post-event *MOB* is also significant at the 0.01 level ($t = -4.28$). The results of the univariate test of *EENR*, *EEXR* and *MOB* above are consistent with the prediction that the cancellation of the audit fee floor enhances audit-market competition.

Table 3 Test of Difference Between Pre-event Period and Post-event Period Indicators of Audit-market Competition

	Pre-event period			Post-event period			Test of difference			
	N	Mean	Median	N	Mean	Median	<i>t</i> -stat	<i>Pr</i> > <i>t</i>	Z-stat	<i>Pr</i> > Z
<i>EENR</i>	118	-0.041	-0.029	160	0.018	0.000	-5.65	<.000***	-5.83	<.000***
<i>EEXR</i>	118	0.014	0.000	160	0.061	0.052	-3.71	0.000***	-3.24	0.001***
<i>MOB</i>	118	0.024	0.019	160	0.039	0.033	-4.28	<.000***	-4.08	<.000***

Notes:

1. N = number of observations.
2. *, ** and *** denote statistically significant at 0.1, 0.05 and 0.01 levels respectively, in a two-tailed test.

3. Variable definitions:

EENR: excess entry rate = auditor entry rate minus client entry rate.

EEXR: excess exit rate = auditor exit rate minus client exit rate.

MOB: audit-market-share mobility.

By comparing the difference between *EENR* and *EEXR* in detail, we find some intriguing characteristics of the audit market. First, we focus on the sign of *EENR* and *EEXR* in the pre-event period. Negative *EENR* (-0.041) denotes that the increase in supply of audit services is less than the increase in demand for audit services. Positive *EEXR* (0.014) denotes that the decrease in supply of audit services is greater than the decrease in demand for audit services. In other words, during the pre-event period, audit-market competition seems to be slack. One of the reasons behind the evidence above may be the booming development of the Taiwan stock market in the early 1990s, thus fostering the increase in demand for audit services. Next, we compare the magnitude of *EENR* and *EEXR*. The *EENRs* are less than *EEXRs* in both the pre-event and post-event periods, which echoes, to some extent, the attribute of a high degree of auditor concentration.

4.3 Results of Regression

Table 4 displays the regression results of our three empirical models.^{9,10} As can be seen, the *F* values of the three empirical models reach a statistical level of significance, indicating fitness of models. In addition, adjusted R^2 lies between 6.54% and 19.35%, which indicates a moderate explanatory power of models. In the estimation of *t* values, we employ the procedure suggested by White (1980) to correct the variance-covariance matrix. All of the VIFs (not reported here) are less than 2.5, indicating that there is no multi-collinearity between the independent variables.

⁹ In order to avoid empirical results contaminated by extreme values, the latter are identified by statistical conventions. Observations with an absolute value of standardized student *t* greater than 3, cooked value greater than 1 and absolute value of diffits greater than 1, are regarded as extreme values and are deleted. After performing the related regression test again, the empirical results are qualitatively the same as the original results shown in Table 4. Therefore, our results are not materially affected by extreme values.

¹⁰ To avoid the effects of different constituents of industry on results, we use a balanced sample to replace the original pooling data. The number of observations decreases from 278 to 224 (28 cross-sections \times 8 periods). Two treatments are used in econometrics. One is pooling the data and then performing an OLS regression. Another is using panel data and correcting the fixed effect. Both empirical results are qualitatively the same as those reported in Table 4. Hence, results obtained in this study are not impacted by the symmetry of constituents of industry for the pre-event and post-event periods.

Table 4 Regression Results of Audit-market Competition

$$\left. \begin{matrix} EENR_{kt} \\ EEXR_{kt} \\ MOB_{kt} \end{matrix} \right\} = \phi_0 + \phi_1 FLOOR + \phi_2 SPEC_{kt} + \phi_3 ACR3_{kt} + \phi_4 REG_{kt} + \phi_5 CCR4_{kt} + \phi_6 GROWTH_{kt} + \phi_7 MEANSIZE_{kt} + v_{kt}$$

	Dependent variable									
	<u>EENR</u>			<u>EEXR</u>			<u>MOB</u>			
	Predicted sign	ψ	<i>p</i> -value	Predicted sign	ψ	<i>p</i> -value	Predicted sign	ψ	<i>p</i> -value	
Intercept		-0.190	0.078*		0.201	0.203		0.079	0.101*	
<i>FLOOR</i>	+	0.068	0.000***	+	0.031	0.015**	+	0.014	0.001***	
<i>SPEC</i>	-	1.322	0.154	+	1.444	0.163	-	-0.499	0.050**	
<i>ACR3</i>	-	-0.152	0.041**	+	0.195	0.010**	-	0.013	0.571	
<i>REG</i>	-	-0.061	0.000***	-	-0.081	0.000***	-	0.009	0.133	
<i>CCR4</i>	+	0.107	0.117	-	-0.166	0.057*	-	-0.044	0.136	
<i>GROWTH</i>	+	0.002	0.871	+	0.005	0.753	+	0.004	0.422	
<i>MEANSIZE</i>	?	0.015	0.052**	?	-0.018	0.121	?	-0.004	0.218	
<i>F</i> -value		10.493	<.000***		9.962	<.000***		3.770	<.000***	
Adj.- <i>R</i> ²		19.35%			18.47%			6.54%		

Notes:

1. Number of observations is 278.
2. We use the number of clients to estimate the market share of an audit firm.
3. The heteroskedasticity has been adjusted by the White procedure (1980).
4. *, ** and *** denote statistically significant at 0.1, 0.05 and 0.01 levels respectively, in a two-tailed test.
5. Variable definitions:

EENR: excess entry rate = auditor entry rate minus client firm entry rate.
EEXR: excess exit rate = auditor exit rate minus client firm exit rate.
MOB: audit-market-share mobility.
FLOOR: cancellation of audit fee floor = 1 when the time period is after 1998 and 0 otherwise.
SPEC: the first indicator of industry specialization = the ratio of industry-specific revenue to total revenue.
ACR3: the second indicator of industry specialization = sum of the industry-specific market share of the 3 largest audit firms.
REG: regulated industry = 1 when the industry whose accounting procedure is regulated and particular in nature and 0 otherwise.
CCR4: industry concentration = sum of the industry-specific market share of the 4 largest client firms.
GROWTH: industry in growth = 1 if the growth rate of a client industry is higher than that of all industries and 0 otherwise.
MEANSIZE: average size of client firms = sum of the nature log of total assets of each company divided by the number of total companies.

Consistent with expectations, coefficients on experimental variable *FLOOR* are significantly positive. It is determined that the auditor excess entry rate (*EENR*), excess exit rate (*EEXR*) and audit-market-mobility (*MOB*) during the post-event period are significantly higher than those during the pre-event period and that audit-market competition is heightened. Regarding control variables, *SPEC* is significantly negative in the regression model of *MOB*. This illustrates that the degree of auditor specialization in a specific industry increases, the ability to sustain market share increases, and, in turn, the degree of market-share-mobility decreases. *ACR3* is significantly negative (positive) in the regression model of *EENR* (*EEXR*). This indicates that, in a specific industry, higher auditor concentration can thwart the entrance of potential rivals and force the exit of incumbent rivals. As a result, excess entry rate decreases while excess exit rate increases. *REG* is significantly negative in the regression models of *EENR* and *EEXR*. This indicates that, in a regulated industry, both entry and exit barriers are higher while both excess entry rate and excess exit rate are lower. *CCR4* is significantly negative in the regression model of *EEXR* only. This implies that higher industry concentration will cause the surviving companies to be reluctant to use the same auditors as their rivals in that industry. Hence, the excess exit rate is lower. Finally, *MEANSIZE* is significantly positive in the regression model of *EENR*. It indicates that industries with a larger mean size of companies attract more auditors. Hence, the excess entry rate of industries with a larger mean size of companies is higher than that of industries with a smaller mean size of companies.

5. Additional Analyses

5.1 Tradeoff Between Market Competition and Audit Quality

The implications of deregulation are likely to be a tradeoff between its benefits and the potential problems associated with it. Increase in competition, being the focus of this study, is considered to be one of the potential benefits. However, auditors might be motivated to low-ball in soliciting more businesses after deregulation, which might have adverse implications on the quality of the audit. Therefore, in this section we discuss the effect of the cancellation of the audit fee floor on audit quality which is surrogated by the following three proxies: (1) audit fee, (2) financial restatement due to misstatements, and (3) modified audit opinion.

According to the product differentiation theory (Klein and Leffler, 1981; Shapiro, 1983), price can be used as a proxy variable of product quality. In Taiwan, the audit fee of a public company was not publicly available until 2002. Therefore, this study obtains average audit fee data from the Survey Report of Public Accounting Firms in Taiwan, published by the Financial Supervisory Commission, Executive Yuan. The average audit fee is approximated by dividing each audit firm's revenues from a public company by its number of public company clients. A two-sample difference comparison is performed and empirical results are listed in Panel A of Table 5.

Table 5 Test of Difference of Audit Quality During Pre-event and Post-event Period

Panel A: Audit fee

	Pre-event (N=275)		Post-event (N=275)		<i>t</i> -stat	Test of difference		
	Mean	Median	Mean	Median		<i>Pr</i> > <i>t</i>	Z-stat	<i>Pr</i> > Z
<i>Rev</i>	14,109,225	2,110,000	39,128,391	2,628,500	-2.88	0.0042***	-1.93	0.0545**
<i>Client</i>	28	5	109	5	-2.79	0.0056***	-0.82	0.4118
<i>AAFee</i>	542,213	472,709	634,709	545,000	-2.61	0.0093***	-2.02	0.0438**

Panel B: Modified audit opinion and earnings restatement

	Pre-event		Post-event		<i>t</i> -stat	Test of difference		
	N	Mean	N	Mean		<i>Pr</i> > <i>t</i>	Z-stat	<i>Pr</i> > Z
<i>RESTATE</i>	1,160	2.93	2,235	2.01	1.59	0.1124	1.68	0.0926*
<i>MAO</i>	1,076	1.98	2,064	2.87	-1.96	0.0507**	-1.80	0.0716*

Note:

1. N: Number of observations. Unit of sample: audit firm-year in Panel A and company-year in Panel B.
2. *, ** and *** denote statistically significant at 0.1, 0.05 and 0.01 levels respectively, in a two-tailed test.
3. Variable definitions:

Rev: Total audit revenues from public client firms and expressed in new Taiwan dollars.

Client: Number of public client firms.

AAFee: Mean audit revenues from public client firms and defined as $Rev \div Client$.

RESTATE: Earnings restatement = 1 when financial statements restate due to misstatement and auditors do not qualified on them then, and 0 otherwise.

MAO: Modified audit opinion = 1 when the audit opinion is modified for uncertainty, going concern, scope limitation and NonGAAP, and 0 otherwise.

As indicated in Panel A of Table 5, the means of *AAFee* are \$542,213 and \$634,709 respectively, before and after the cancellation of the audit fee floor, and their difference is significant at the 0.01 level ($t = -2.61$). Similar results are obtained for the medians of *AAFee*. Based on the results above, on average, the audit fee does not decline after the cancellation of the audit fee floor and even reveals a tendency to rise.¹¹

An audit failure occurs in two circumstances: when GAAP are not enforced by the auditor (GAAP failure); and when an auditor fails to issue a modified audit report in the appropriate circumstances (audit report failure). Accordingly, using the public company data, we construct two proxy variables of audit quality, earnings restatement and modified audit opinion. Earnings restatement (*RESTATE*) is referred to as the restatement of misstated financial statement. When an auditor issues a clean audit opinion for the misstatement, *RESTATE* is set to be 1, and 0 otherwise. The higher the value of *RESTATE*, the lower the audit quality. Modified audit opinion (*MAO*) is an audit report that departs from an unqualified report due to uncertainties, doubt about

¹¹ The results of Table 5 are qualitatively the same with and without the price level adjustment.

going concern, scope restriction and generally accepted accounting principle departure.¹² When the audit report is a modified audit opinion, *MAO* is set to be 1, and 0 otherwise. The higher the value of *MAO*, the higher the audit quality.

Panel B of Table 5 reports the empirical results of *RESTATE* and *MAO*.¹³ Before and after the cancellation of the audit fee floor, the means of *RESTATE* are 2.93% and 2.01% respectively. After the cancellation of the audit fee floor, the smaller mean of *RESTATE* indicates an increase in audit quality although it is not statistically significant. Before the cancellation of the audit fee floor, the mean of *MAO* is 1.98%, and reaches 2.87% after the event. Significant differences between the means of *MAO* implied an increase in audit quality ($t = -1.96$).

Deregulation is expected to enhance market competition. If an audit firm expands market share by using a price-cutting strategy, presumably its audit quality is impaired. However, all the evidence from the audit fee, financial restatement, and modified audit opinion indicates that audit quality does not decline significantly after the event.

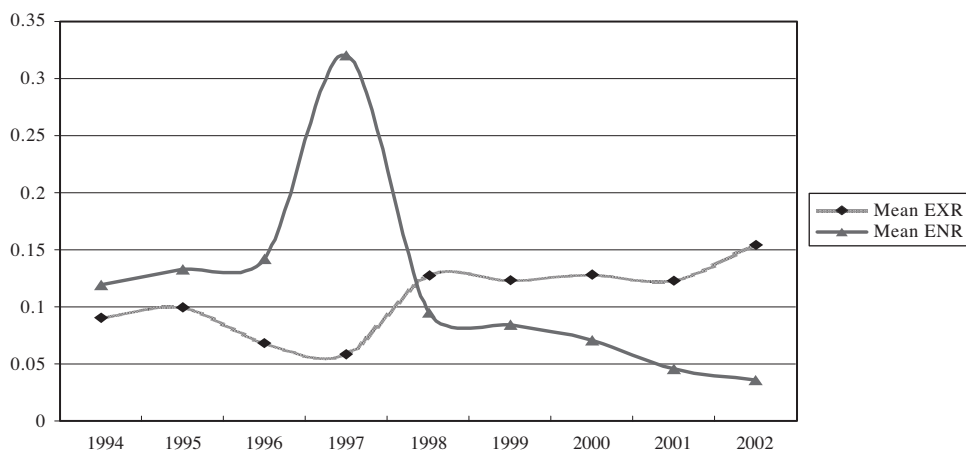
5.2 Comparison of *EENR* (*EEXR*) used in this Study with *ENR* (*EXR*) used in BMM

In this section, we contrast our market competition indicators with those used in BMM. Figure 2 presents the trends of *ENR* and *EXR* used by BMM. The statistics used are the means. As presented, $EXR < ENR$ before 1997 but $EXR > ENR$ after 1998, implying that competition degree in the audit market declines. Comparatively, in Figure 1, although $EEXR > EENR$ throughout sampling period, changes in the differences between *EEXR* and *EENR* indicate that *EEXR* approaches *EENR* and that competition degree in the audit market increases.

¹² Inconsistent application of accounting principles is one of the conditions requiring departure from a standard unqualified report. However, the situation does not empower the auditor with discretion over audit decision-making. Hence, prior research regarded the inconsistent application of accounting principles as a condition for issuing an unqualified opinion. This paper takes the same view.

¹³ In Taiwan, the criteria for restatement of financial statement were loosened in 2002. To avoid the confusing effect caused by the policy, we confine the sample period to 3 years before and after the event, that is, 1995–1997 vs 1999–2001. If we expand the sample period to be 4 years before and after the event, results obtained are unchanged but the statistically significant level rises from 10% to 5%.

Figure 2 Tendency of Entry and Exit Indicators used in BMM



Note:

Variable definitions:

ENR: auditor entry rate.

EXR: auditor exit rate.

The testing results of the differences between components of *EENR* (*EEXR*) are reported in Table 6. As shown in Panel A, average auditor entry rate (*ENR*) is 17.2% during the pre-event period and drops to 5.7% during the post-event period. Differences of *ENR* between both periods reach statistical significance ($t = 8.23$; $Z = 7.58$). Next, although *ENR* was lowered significantly, the client entry rate (*CENR*) was also lowered significantly during the post-event period. Because the drop degree of *CENR* is greater than that of *ENR*, *EENR* rises significantly. In other words, the increase in the supply of audit service is smaller than the increase in the demand for audit service ($EENR = ENR - CENR = -0.041 < 0$) during the pre-event period. During the post-event period, however, the increase in the supply of audit service is greater than the increase in the demand for audit service ($EENR = ENR - CENR = 0.018 > 0$). So audit-market competition is enhanced due to the abolition of the audit fee floor. Similarly, Panel B shows that the auditor exit rate (*EXR*) increases significantly during the post-event period but the client exit rate (*CEXR*) remains steady. Consequently, the excess exit rate (*EEXR*) increases significantly.

Table 6 Test of Difference Between Components of *EENR* and *EEXR*Panel A: Components of *EENR*

	Pre-event period			Post-event period			Test of difference			
	N	Mean	Median	N	Mean	Median	<i>t</i> -stat	<i>Pr</i> > <i>t</i>	Z-stat	<i>Pr</i> > Z
<i>ENR</i>	118	0.172	0.125	160	0.057	0.015	8.23	0.000***	7.58	0.001***
<i>CENR</i>	118	0.213	0.167	160	0.039	0.016	11.53	<.000***	10.97	<.000***
<i>EENR</i>	118	-0.041	-0.029	160	0.018	0.000	-5.65	<.000***	-5.83	<.000***

Panel B: Components of *EEXR*

	Pre-event period			Post-event period			Test of difference			
	N	Mean	Median	N	Mean	Median	<i>t</i> -stat	<i>Pr</i> > <i>t</i>	Z-stat	<i>Pr</i> > Z
<i>EXR</i>	118	0.073	0.065	160	0.123	0.111	-4.55	0.000***	-4.09	0.001***
<i>CEXR</i>	118	0.059	0.035	160	0.062	0.024	-0.34	0.731	-0.020	0.985
<i>EEXR</i>	118	0.014	0.000	160	0.061	0.052	-3.71	0.000***	-3.24	0.001***

Notes:

1. N = number of observations.
2. *, ** and *** denote statistically significant at 0.1, 0.05 and 0.01 levels respectively, in a two-tailed test.
3. Variable definitions:

ENR: auditor entry rate.
CENR: client entry rate.
EENR: excess entry rate = *ENR* – *CENR*.
EXR: auditor exit rate.
CEXR: client exit rate.
EEXR: excess exit rate = *EXR* – *CEXR*.

In addition to *EENR* and *EEXR* used in this study, to control the effect of the demand for audit service on our results, we develop a regression model relating *ENR* (*EXR*), dependent variables, to *CENR* (*CEXR*), control variables. That is, we control the demand for audit service in the prediction of the supply of audit service. Empirical models are shown as follows

$$ENR_{kt} = \phi_0 + \phi_1 FLOOR + \phi_2 CENR + \phi_3 CENR \times FLOOR + \phi_4 SPEC_{kt} + \phi_5 ACR3_{kt} + \phi_6 REG_{kt} + \phi_7 CCR4_{kt} + \phi_8 GROWTH_{kt} + \phi_9 MEANSIZE_{kt} + v_{kt} \quad (2)$$

$$EXR_{kt} = \phi_0 + \phi_1 FLOOR + \phi_2 CEXR + \phi_3 CEXR \times FLOOR + \phi_4 SPEC_{kt} + \phi_5 ACR3_{kt} + \phi_6 REG_{kt} + \phi_7 CCR4_{kt} + \phi_8 GROWTH_{kt} + \phi_9 MEANSIZE_{kt} + v_{kt} \quad (3)$$

Table 7 reports the results of the regression model of *ENR* (*EXR*) with and without *CENR* (*CEXR*) included as a control variable. When we do not control the effect of demand for audit service, the coefficient of *FLOOR* is significantly negative in the regression model *ENR* ($\psi_1 = -0.114$, *p*-value = 0.000). The coefficient of *FLOOR*

is significantly positive in the regression model *EXR* ($\psi_1 = 0.039$, p -value = 0.001). Accordingly, if we do not control the effect of demand for audit service, we would find evidence of decreasing *ENR* and increasing *EXR*, which, in turn, make an incorrect inference to conclude that the degree of audit-market competition decreases after the abolition of the audit fee floor. Conversely, if the supply of and demand for audit service are observed simultaneously, we would have evidence of increases in both the excess entry rate and excess exit rate and conclude that competition in the audit market is enhanced.

Table 7 Regression Results of Market Competition Indicators of BMM and This Paper

	Predicted sign	Dependent variable							
		<i>ENR</i>				<i>EXR</i>			
		ψ	p -value	ψ	p -value	ψ	p -value	ψ	p -value
<i>Intercept</i>		0.793	0.000***	0.126	0.111	-0.093	0.364	0.025	0.815
<i>FLOOR</i>	+	-0.114	0.000***	0.031	0.014**	0.039	0.001***	0.035	0.009***
<i>CENR</i>	+			0.741	0.000***				
<i>CEXR</i>	+							0.388	0.012**
<i>CENR</i> × <i>FLOOR</i>	?			-0.314	0.025**				
<i>CEXR</i> × <i>FLOOR</i>	?							0.011	0.948
<i>SPEC</i>	-	1.140	0.577	1.046	0.179	2.013	0.023**	1.806	0.042**
<i>ACR3</i>	-	-0.073	0.518	-0.108	0.073*	0.108	0.161	0.141	0.041**
<i>REG</i>	-	-0.015	0.393	-0.045	0.000***	-0.037	0.006***	-0.054	0.000***
<i>CCR4</i>	+	-0.132	0.286	0.027	0.668	-0.067	0.335	-0.105	0.127
<i>GROWTH</i>	+	0.006	0.708	0.005	0.676	0.014	0.317	0.010	0.436
<i>MEANSIZE</i>	?	-0.039	0.000***	-0.004	0.492	0.008	0.254	-0.003	0.733
<i>F</i> -value		16.528	<.000***	71.640	<.000***	6.260	<.000***	9.402	<.000***
Adj.- <i>R</i> ²		28.18%		69.65%		11.73%		21.45%	

Notes:

1. Number of observations is 278.
2. We use the number of clients to estimate the market share of an audit firm.
3. As to the heteroskedasticity in the model, t-statistics and p-value are adjusted by the White (1980) procedure to correct the covariance matrix.
4. *, ** and *** denote statistically significant at 0.1, 0.05 and 0.01 levels respectively, in a two-tailed test.
5. Variable definitions:

ENR: auditor entry rate.

CENR: client entry rate.

EXR: auditor exit rate.

CEXR: client exit rate.

FLOOR: cancellation of audit fee floor = 1 when the time period is after 1998 and 0 otherwise.

SPEC: the first indicator of industry specialization = the ratio of industry-specific revenue to total revenue.

ACR3: the second indicator of industry specialization = sum of the industry-specific market share of the 3 largest audit firms.

- REG:* regulated industry = 1 when the industry whose accounting procedure is regulated and particular in nature and 0 otherwise.
- CCR4:* industry concentration = sum of the industry-specific market share of the 4 largest client firms.
- GROWTH:* industry in growth = 1 if the growth rate of a client industry is higher than that of all industries and 0 otherwise.
- MEANSIZE:* average size of client firms = sum of the nature log of total assets of each company divided by the number of total companies.

As shown in Figure 2 and Tables 6 and 7, if we neglect the factor of demand for audit service, we would make a reverse inference about the changes in audit-market competition.

6. Conclusion and Policy Implication

Here in Taiwan, the long-standing audit fee standard was abolished by the Fair Trade Commission in 1998. This study aims to investigate the effects of the cancellation of the audit fee floor on audit-market competition over public companies during 1994–2002. In other words, after the event, do the auditor excess entry rate, excess exit rate and audit-market-share mobility increase? We define the audit client industries as a sub-audit market and obtain 278 industry-year observations. Main results indicate that, after the event, the auditor excess entry rate, auditor excess exit rate and audit-market-share mobility increase, consistent with the expectation of enhanced audit-market competition.

This study provides policy implications for the controversy of the audit fee standard. No salient evidence indicates that audit quality declines after the cancellation of the audit fee floor. Pearson and Trompeter (1994) point out that the audit market is a monopolistic competition market. In selecting an auditor, a client makes a tradeoff between audit quality and audit fee. Those clients who are not concerned about audit quality hope to acquire standard audit service at the cheapest price. There also exist clients who wish to obtain a high quality audit service at a higher price. Hence, it is not important to worry about the turmoil in the audit market caused by some price-cutting cases.

In addition, empirical results show that audit-market competition is enhanced, and some auditors exit the market after the cancellation of the audit fee floor. Does the increase in auditor exit rate indicate that the cancellation causes the audit market to become over-competitive and jeopardizes the survival of auditors? The Chair of Taiwan FASB, Ting-Wong Cheng, argues that the demand for a financial statements audit is derived from authoritative requirements. Under the constant demand for audit service, he said, establishment of the audit fee standard results in a lack of withdrawal (closure) mechanism in the audit market and results in a deficiency in adaptability to the changing environment. Hence, he added, establishment of the audit fee standard safeguarded inefficient auditors only (Cheng, 2003).

Finally, empirical results indicate that, after the cancellation, the excess exit rate is higher than the excess entry rate. However, the net excess exit rate exists not only after but also before the cancellation of the audit fee floor. In other words, the fact that

the excess exit rate is higher than the excess entry rate does not imply an over-intense competition in the audit market caused by the cancellation of the audit fee floor. On the contrary, to some extent, it just reflects a high degree of auditor concentration.

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