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Business service market share, international operation strategy and performance

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Abstract

Purpose – This paper aims to explore the relationship between market share and performance of large accounting firms. It also investigates whether the performance of international accounting firms is better than that of non-international accounting firms.

Design/methodology/approach – This paper divides the empirical analysis into two stages. The first stage constructs a multiple regression model to explore the relationship between market share, international operations and the performance of large accounting firms. The second stage uses the Tobit regression model to identify the determinants of market share of international accounting firms.

Findings – Empirical results show that there is a significant, positive relationship between market share and performance, and that the performance of international accounting firms is better than that of non-international accounting firms. Second, from the perspective of business characteristics, the scope of the most international accounting firms is traditional auditing services; namely financial attestation and tax business services.

Practical implications – From the clients' viewpoint, market share is one of the key indices in determining the quality of the accounting firms' service.

Originality/value – As the market for auditing services in Taiwan is saturated, in the future, the accounting industry will be concerned with non-auditing services. It is suggested that the large accounting firms could follow the demand changes of their clients: employ professionals in various fields to provide specialized services, adjust the range of transnational and management consultant services, and operate management consultant services more aggressively. These measures would have advantages in a fiercely competitive market.

Keywords Marketing strategy, Competitive strategy, Management development, Organizational performance, Customer services quality

Paper type Research paper

1. Introduction

After Taiwan entered the WTO, enterprises were faced with various threats to their profitability such as increased competition, more complex business operations and globalization. This has driven accounting firms to expand their services to global levels to meet their clients' demands and, thus, international accounting firms have developed in Taiwan. All large Taiwanese accounting firms with a good reputation and high turnover have allied themselves with large accounting firms in the USA. From 1992 to

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1998, accounting firms fostered alliances with their US counterparts, including T N Soong & Co (TNS), KPMG, Deloitte & Touche Taiwan (D&TT), Coopers & Lybrand (C&Y), PricewaterhouseCoopers Taiwan (PwC), and Ernst & Young (E&Y), who, respectively, allied with Arthur Anderson, KPMG, Deloitte Touche Tohmatsu, Cooper & Lybrand, PricewaterhouseCoopers International, and Ernst & Young. On June 1, 2003, TNS and D&TT merged to become the Deloitte & Touche (D&T) accounting firm (Lee, 2010). Following the merger of TNS and D&TT, more than 2,000 people were employed at D&T, making it the largest accounting firm in Taiwan. In addition, following the merger, market share of D&T on the public listed and OTC markets was approximately 35 percent (Tsai and Ni, 2006). After two waves of consolidations, ending in 2003, D&T, KPMG, PwC and E&Y, became the Big Four international accounting firms that dominate the Taiwanese auditing market (Lee, 2010).

By 2006, there were 807 accounting firms in Taiwan of which 50 could be considered to be large, with total revenues accounting for 75.30 percent of the total revenues of the accounting industry and services accounting for 52.83 percent. Although the number of small accounting firms has increased, their market share has decreased. The total revenues and services of the Big Four international accounting firms in Taiwan account for 61.21 and 26.41 percent of the accounting industry, respectively. In other words, the total revenues of the other 803 accounting firms account for only 38.79 percent. The total revenues of the 46 large accounting firms, excluding the Big Four, account for only 14.09 percent. As can be seen, the large firms have become larger and small firms have remained small. Competition in the accounting industry is intense and large domestic accounting firms face hardships from the increased competition and challenges. The superior workforce resources of the Big Four make it even more difficult for medium and small accounting firms to compete.

Kosmidou *et al.* (2006) explore the performances of small and large UK banks across multiple criteria such as asset quality, capital adequacy, liquidity, and efficiency/profitability. Of these indices, operating efficiency and profitability are the most important criteria for the service industry. Market share is an important factor in influencing a company's profitability and is of substantial reference value in strategic management. In the well-known BCG model, market share mirrors the place that a company holds in competition. Companies with high market share are more able to satisfy consumers' demands than those with a low share and enjoy a better competitive advantage (Schwalbach, 1991). In general, three arguments support the positive relationship of market share and profitability. They are economies of scale effects (Bass *et al.*, 1978; Hatten *et al.*, 1978; Ravenscraft, 1983; Shepherd, 1972), experience curve effects, and market power effects (Kohli *et al.*, 1990). Much of the literature indicates that the larger the market share, the more profitable (Allen, 2006; Buzzell *et al.*, 1975; Fraser and Hite, 1990; Sleuwaegen and Goedhuys, 2003).

There is some literature that explores the relationship between market share and other performance indicators. Falkenberg (1984) indicates that from a marketing perspective, market share is determined mainly by the relative attractiveness of a firm's total offering and finds that quality and market share are positively associated. Suzuki (2000) proposes a new method of modeling the relationship between on-time performance and market share in the airline industry. The study results imply that on-time performance affects a carrier's market share primarily through the passengers' experience and not through advertising its performance.

Stank *et al.* (2003) examine the relationship among three dimensions of logistics service performance (operational, relational, and cost performance), customer satisfaction, customer loyalty, and market share. Their results support the strong relationship between customer satisfaction and loyalty. It also establishes an empirical link between customer loyalty and a measure of market share. Baker and Sinkula (2005) explore the environmental marketing strategy and firm performance and consider the effects on new product performance and market share. Therefore, according to the above related research, this paper recognizes that market share is closely correlated with the performance and that it can be an important index of operating performance. In the accounting industry, do accounting firms with larger market shares necessarily have better performances? This question motivates the author to explore this issue. This research is the main purpose of this paper.

Accounting firms belong to the service industry. Large international accounting firms usually dominate auditing markets in Taiwan and abroad; thus they play a very important role. Clients of international accounting firms are usually large, publicly listed companies that operate at complicated, often global, broad levels; therefore, the accounting firms that undertake assignments for these companies are international operators. There may be a wide gap in scale of business between allied accounting firms and those that are not allied in view of the fact that international accounting firms' clients are big and can afford higher auditing fees. This paper also investigates the market share of business services, the performance of the international accounting firms in Taiwan and whether these international accounting firms operate better than the non-international accounting firms. This is the second purpose of this paper.

In addition, accounting firms mainly provide four types of business services: finance attestation, tax service, management consultant, and corporate registration and other services (Chen and Lee, 2006; Lee, 2009, 2010). The four types of business have their respective market demands. Regarding the demand of company clients for business operations, accounting firms can provide suitable professional services to the companies. This paper explores which business services will contribute more to international accounting firms; that is, what investment in such a business services would promote the market share of the accounting firms. Which business services are to be developed by the accounting firms; that is, what is the future potential of the market? This is the third purpose of this paper.

Large accounting firms, both international and non-international, offer similar business services in terms of the nature, type, scope and subject. However, the non-international accounting firms not only have international competition and competition from the more diversified services offered by international accounting firms, but also competition from the localized and lower pricing of the medium and small accounting firms. In addition, the auditing market in Taiwan is saturated; thus, it is a challenge for the large accounting firms to maintain their competitive advantage and sustain operations. Therefore, this paper will focus on the large accounting firms and investigate their market share and performance in order to provide useful information on business service strategies for large accounting firms.

The remainder of this paper is organized as follows. Section 2 gives a review of the literature and shows the development of the two main hypotheses; in Section 3 the research design, data sources and selection criteria are presented. There is also elaboration of the operational definition of the variables and the construction of the

regression model; Section 4 presents the discussion of the empirical results, as well as the descriptive statistics, correlation coefficients and regression results; Section 5 gives the conclusions and management implications.

2. Hypotheses

2.1 Hypothesis: the relationship between market share and performance

Many studies indicate that there is a positive relationship between a company's profitability and its market share. Buzzell and Gale (1987) point out that a company's high market share will directly generate high profitability. To be explicit, a company can increase its sales to lift sales revenues and, thus, lessen average costs. It does this by utilizing experience curve effects that increases its profitability (Day and Montgomery, 1983) and further lifts its market share (Martin, 1988; Schroeter, 1988; Staten *et al.*, 1988). The power of the market allows companies with higher market shares to achieve lower input costs; thus, these companies act as price fixers rather than being followers of the market.

Boulding and Staelin (1990) propose a model which reflects the relationship between market share and profitability. Applying the static model divides the profit into two compositional factors: total revenues (*TR*) and total costs (*TC*):

$$TR \equiv Q \times P \equiv IS \times MS \times P, \tag{1a}$$

$$TC \equiv Q \times C \equiv IS \times MS \times C, \tag{1b}$$

where Q indicates the quantity of sales made by the company, P is the price per unit, IS is the quantity of industrial sales, MS is the market share and C is the cost per unit.

From equations (1a) and (1b), company profit can be expressed as follows:

$$\Pi \equiv IS \times MS \times (P - C), \tag{2}$$

Equation (2) indicates that the factors affecting company profits include the quantity of industrial sales (*IS*), market share (*MS*) and profit per unit ($P - C$). According to the implications of the structure-conduct-performance (SCP) paradigm, changes of market structure will lead to changes in a company's behavior and thus affect its performance. From the accounting perspective, despite the changes in market structure and a company's behavior, three factors: quantity of industrial sales, market share, and profit per unit are the functions that affect a company's profits.

There are indications in the literature that the larger the market share, the better the profitability is likely to be (Allen, 2006; Buzzell *et al.*, 1975; Fraser and Hite, 1990; Sleuwaegen and Goedhuys, 2003). Some literature also shows that there is a relationship between market share and performance (Dussauge *et al.*, 2004; Hibbard *et al.*, 2005; Laverty, 2001). The hypothesis presented in this paper is that higher market share is an indication that an accounting company will have wider client resources, more available services and a better reputation than those with lower market share. Therefore, accounting firms with higher market shares will show a better performance compared with accounting firms with lower market shares. This paper develops hypothesis 1 as follows:

H1. The market share of accounting firms and performance are positively correlated.

2.2 Hypothesis: international accounting firms and their performance

In view of the increasing globalization of enterprises, it is to be expected that capital markets would naturally follow this trend. Enterprises will demand more capital, through various channels, in order to attain growth in emerging markets (Narasimhan and Chung, 1998, p. 201). To meet the globalization requirements of company operations, accounting firms have begun to develop international components to satisfy clients' service demands. Narasimhan and Chung (1998, p. 201) point out that accounting firms obtain credit by developing global markets, which explains why the Big Eight merged into the Big Six; they wanted to increase their opportunities in international markets by providing more international services to multinational corporations.

Vital auditing quality controls are required if a company is to survive in the long-term. These depend on the firm's ability to claim and maintain the processes and results of quality checks (Carpenter and Dirsmith, 1993). Beatson *et al.* (2008) find that service orientation affects satisfaction and trust, and trust influences satisfaction and commitment. In turn, satisfaction, trust and commitment have an impact on positive behavioral intentions. Service quality is a vital, fundamental factor required if an accounting firm is to be competitive. In auditing markets, it is accepted that if an accounting firm has a good reputation, in most cases this indicates good auditing quality (Moizer, 1997). Dopuch and Simunic (1980) argue that the Big Eight's credibility earned from clients is higher than that of the other firms. DeAngelo (1981) points out that there is a positive relationship between auditing quality and firm size, and newly listed enterprises tend to seek help and services from bigger accounting firms (Moizer and Turley, 1989). Hence, according to previous theoretical and empirical literature, the international accounting firms have good reputations and credibility with their clients.

Clients trust the bigger accounting firms more than the smaller ones because of the better service quality (DeAngelo, 1981; Schwartz, 1997). Behn *et al.* (1999) explore whether a customer satisfaction index could explain the cross-sectional variations in auditing fees paid by *Fortune* 1000 clients to the Big Six. Their study points out that the consumer survey of clients of the Big Six indicated a positive relationship between customer satisfaction indices and auditing fees, given control of other factors related to auditing fees. The Big Six accounting firms generally provide timely personalized service that increase customer satisfaction with specific auditing teams.

In line with the above studies, this paper suggests that the high service quality of international accounting firms would result in high consumer satisfaction indices, and high consumer satisfaction leads to consistent clients' loyalty to accounting firms. Responding to this, clients are willing to pay higher auditing fees for higher auditing quality. In addition, owing to the fact that clients of international accounting firms all belong to larger corporations, their diverse and complicated scales of operation require more time and effort as well as higher costs and, thus, these firms will earn more auditing fees than non-international accounting firms. Therefore, international accounting firms will generate greater revenues and show better performance than non-international accounting firms. This paper develops hypothesis 2 as follows:

H2. The performance of international accounting firms is better than that of non-international accounting firms.

3. Methodology

3.1 Sample and data sources

This paper uses the database from the "Census Report of Public Accounting Firms", covering the years from 1989 to 2003, released by the Statistics Department of the Ministry of Finance in Taiwan, ROC. The scope of the database survey covers all accounting firms in terms of a general overview and the number of employees of the firm. Details of the employees include the level of education, age, and annual salary. Further information is given of the firm's business revenue and expenditure throughout the year.

According to the survey, business items can be divided into four parts: financial attestation services, tax services, management consultant services, and corporate registration and other services. Business revenues from these four types of business are included in the total business revenues. The revenues from the financial attestation service include publicly issued enterprises' auditing revenues, financing auditing revenues and other financial auditing revenues. Tax services revenues include audited certification of income tax, tax planning, tax administrative relief revenues, and other tax revenues.

Due to the size and turnover of publicly issued enterprises, inevitable disparities in operational scale exist between those accounting firms that have undertakings and those that do not (Chen and Lee, 2006). As accounting firms with sole proprietorship are not permitted to undertake the responsibilities of auditing public enterprises' financial reports, in general only large accounting firms are able to provide public enterprises' auditing services. For the subjects of this paper, partnership accounting firms with two or more certified public accountants (CPAs) which can provide public enterprises' auditing business services have been selected.

According to the above specification, this paper investigates 895 partnership-type large accounting firms that can provide auditing services to public enterprises. Lee (2012) uses the INT variable. Its operational definition is the selection of a group of leading accounting firms in Taiwan that have made alliances with the top four, five, or six US international accounting firms. These Taiwanese firms are defined as international accounting firms (Lee, 2012, pp. 435-436). In this paper, international accounting firms are defined according to the practice of Lee (2012) by selecting the accounting firm's alliances with the top four, five, or six US international accounting firms. These firms are the sample of accounting firms with internationalized business operations. On the other hand, samples that are not included in this range are defined as non-international accounting firms. In the sample of large accounting firms, there are 79 international and 816 non-international accounting firms.

3.2 Measurement of the performance

A characteristic feature of the accounting industry is that the partners of accounting firms are the principal managers. Because of this, accounting firms belong to the group of firms with conjoint ownership and operational rights and any profits are allocated according to partners' performance. Thus, the partners are entitled to a division of the profits at the end of the year. In addition, because accounting firms have independent management or partnerships, this paper focuses on the profit each partner earns. In addition, in accordance with the market share-profitability relation model proposed by Boulding and Staelin (1990), and characteristic of accounting firms, this paper uses

profitability as a dependent variable to measure performance (*PF*) in the empirical analysis. According to Chen and Lee (2006), based on written discussions of performance of strategic alliances between consulting businesses and accounting firms, accounting firm performance is defined as the annual total revenues, less annual expenditures, plus salaries of partners. Lee (2012) measures the profit rate by annual total revenues of the accounting firm, less annual total expenditures of the accounting firm, plus remunerations to partners, then divide annual total revenues of the accounting firm. This paper uses the same database as Chen and Lee (2006) and Lee (2012) showing that annual total expenditures include the partners' salaries. Because salary standards vary among accounting firms, this paper uses the add-back method of evaluating partners' salaries to lessen artificial disturbance of salary expenditure. This paper hereby defines the *PF* variable as follows:

$$\text{Performance } (PF) = (\text{annual total revenues} - \text{annual total expenditures} + \text{partners' salaries}) \div \text{number of partners at the end of the year}$$

3.3 Measurement of independent variables

On the independent variables, Boulding and Staelin (1990) model indicates that profit will be affected by market share; thus, this paper uses the total business revenues of accounting firms as the basis for calculating the market share of individual accounting firms. This is to test the relationship between market share and performance for *H1*. The market share (*MS*) is defined as follows:

$$\text{Market share } (MS) = \text{total business revenues of the individual accounting firm} \div \text{total business revenues of the entire public accounting profession}$$

The above calculation of market share is based on the total business revenues of accounting firms; however, the total business revenues of the individual accounting firms include auditing and non-auditing business revenues (Chen and Lee, 2006; Lee, 2010). According to the classification from the "Census Report of Public Accounting Firms", the characteristics of total business revenues can be divided into revenues from financial attestation services, tax services, management consultant services and corporate registration and other services (Chen and Lee, 2006; Lee, 2009, 2010). This perspective is used in this paper; the total business is divided into auditing and non-auditing functions in order to calculate the market share of each. It then further divides the total business revenues into four kinds of businesses to calculate sub-market shares of individual accounting firms in order ascertain various implications for practice and theory. The above six business sub-market shares are calculated as shown in Table I.

Narasimhan and Chung (1998) indicate that accounting firms expand their markets and benefits, in both revenues and operations, to address globalization tendencies. Many theories and empirical studies have validated the positive relationship between an accounting firm's size and auditing quality to their large size and that they are acknowledged to provide good auditing services of high quality (DeAngelo, 1981; Schwartz, 1997). In addition, most clients of international accounting firms are publicly listed companies. Thus, the auditing fee revenues of the international accounting firms

Variables	Operational definitions
PF	= (annual total revenues − annual total expenditures + partners' salaries) ÷ number of partners at the end of the year
MS	= total business revenues of the individual accounting firm ÷ total business revenues of the entire public accounting profession
MKA	= auditing service revenues of the individual accounting firm ÷ auditing service revenues of the entire public accounting profession
MKNA	= non-auditing service revenues of the individual accounting firm ÷ non-auditing service revenues of the entire public accounting profession
MKF	= financial attestation revenues of the individual accounting firm ÷ financial attestation revenues of the entire public accounting profession
MKT	= tax service revenues of the individual accounting firm ÷ tax service revenues of the entire public accounting profession
MKM	= management consultant revenues of the individual accounting firm ÷ management consultant revenues of the entire public accounting profession
MKC	= corporate registration and other services revenues of the individual accounting firm ÷ corporate registration and other services revenues of the entire public accounting profession
INTA	= international accounting firm (*INTA*) = 1; non-international accounting firm (*INTA*) = 0
PERD	= the year of the investigation − the year of opening + 1
SCALE	= log (total number of staff at the end of the year)
BD	= $\sum_{i=1}^{4} S_i^2$, where S_i represents the percentage of individual business revenues in the total business revenues, $i = 1, 2, 3, 4$, representing financial attestation revenues, tax service revenues, management consultant revenues, corporate registration and other services revenues, respectively.
HC	= salaries ÷ total number of staff at the end of the year
PET	= log[(training expenditures + software and database fees) ÷ number of partners at the end of the year]

Table I.
Variable definitions

are higher than that from non-international accounting firms. Therefore, this paper constructs the second independent variable on whether the accounting firm is international or not (*INTA*). If the accounting firm is an international firm, then assume the dummy variable as $INTA = 1$; if it is not, then assume the dummy variable as $INTA = 0$. The dummy variable serves to measure whether the performance of international accounting firms is better than that of non-international accounting firms, based on *H2*:

$$\text{International accounting firm } (INTA) = 1;$$
$$\text{non-international accounting firm } (INTA) = 0.$$

3.4 Control variables

Apart from independent variables, there are other factors that affect the performance of accounting firms. This paper uses factors discussed or empirically verified in the literature as control variables. Cheng *et al.* (2000) find a significant positive relationship between the age of the company and technical efficiency, indicating that older companies foster better learning conditions and have more human and client resources. Bröcheler *et al.* (2004) suggest that the age of a business is a key enterprise characteristic and affects the chances of an enterprises surviving. Buddelmeyer *et al.* (2010)

indicate that current empirical studies consistently find a positive relationship between innovative activity and company survival. Longer survival of an accounting firm indicates its stable operational abilities. Therefore, this paper assumes a positive relation between the age of an accounting firm and its performance. The following equation measures the age of accounting firms (*PERD*):

$$\text{Age of accounting firm } (PERD) = \text{the year of the investigation} - \text{the year of opening} + 1$$

The size of an accounting firm serves as an efficient measurement of market structure. A big company has substantial influence and a favorable competitive edge. DeAngelo (1981) finds a positive relationship between auditing quality and firm size. Danos and Eichenseher (1986) also find a positive relationship between firm size and market concentration of the Big Eight accounting firms. Cheng *et al.* (2000) indicate that a bigger accounting firm is more technically efficiency, which may result from the effects of economies of scale. This paper uses the size of accounting firms in an empirical model to examine the influence of a firm's size (*SCALE*) on the profitability of accounting firms. The variable equals the logarithm of the staff number at the end of the year, as the following equation shows:

$$\text{Size of accounting firm } (SCALE) = \log(\text{total number of staff at the end of the year})$$

The rapid growth of information technology, together with related regulations, has resulted in more complex inter-company business. Stern and Henderson (2004) find that the relationship between business diversity and survival is contingent on the amount of environmental change wrought by a firm's competitors as they simultaneously diversify their own product portfolios and innovate technologically. Sahoo and Mishra (2012) indicate that operation diversification can result in the better use of organizational resources and show more stable financial performance. In addition, to accommodate the trend towards globalization, companies need to make the effort to broaden and diversify as well as widen their operational content. This requires specialist consulting services. Accounting firms are the most direct providers of these services and, thus, non-auditing revenue has gradually become an important revenue channel (Chen and Lee, 2006). The higher proportion of non-auditing revenues of total business revenues indicates that accounting firms are providing increasingly diversified services. Thus, business diversification can help accounting firms to disperse the operational risks and increase profit. Therefore, this paper expects a positive relationship between business diversification and the performance of accounting firms.

To make the measurement of business diversification more stringent, the Herfindahl-Hirschman Index (HHI) is used in industrial economics to measure the degree of competition in the industry. This principle is applied in the measurement of the business diversification variable. The original implication of the HHI is that a number closer to 1 indicates a higher level of imperfect competition; on the other hand, when the HHI is closer to 1/n, it means that the manufacturers are closer to the state of complete competition; that is, the market share of the manufacturers in the industry is almost equal.

In this paper, total business revenues are divided into financial attestation, tax services, management consultant, corporate registration and other services revenues.

First, the proportion of individual businesses in the total business revenues of the accounting firms is calculated. Next, the squares of the proportions are summed to obtain the HHI value to measure the business diversification (*BD*). According to the HHI principle, when *BD* is closer to 1, this reveals that the accounting firm business is focused on one or two services; hence, it means the degree of business diversification of the accounting firm is low; on the other hand, when *BD* is closer to 1/n, this indicates that the accounting firm business is evenly diversified into various services; hence, the degree of business diversification is high. Therefore, the predicted sign of this variable is expected to be negative. When the value of *BD* is high, it means the business diversification of the accounting firm is lower, thus, this paper expects that the performance of accounting firms will be poor. The business diversification (*BD*) is measured by the following equation:

$$\text{Business diversification } (BD) = \sum_{i=1}^{4} S_i^2,$$

where S_i represents the percentage of individual business revenues in the total business revenues, $i = 1, 2, 3, 4$, representing financial attestation revenues, tax service revenues, management consultant revenues, corporate registration and other services revenues, respectively.

Hitt *et al.* (2001) demonstrate that the human capital structure has a positive impact on the performance of accounting firms. Human resources are important input factors that can determine the success of firm operations (Boohene and Asuinura, 2011; de Menezes *et al.*, 2010; Jones *et al.*, 2010; Lee *et al.*, 2010). Therefore, this paper expects a positive relationship between human capital and the performance of accounting firms. The most direct way to measure human quality is by salary; salaries represent labor costs to the firm and are a comprehensive standard for measuring human quality. Higher salaries imply higher human potential and increased contributions from the staff to the firm. The following equation expresses the human capital (*HC*):

$$\text{Human capital } (HC) = \text{salaries} \div \text{total number of staff at the end of the year}$$

In the educational training of the accounting industry, Chen *et al.* (2002) indicate that there is a positive relationship between training and operational performance of accounting firms. Chen *et al.* (2008) investigate the relationship between continuing professional education (CPE), a mechanism of professional training, and financial performance of public accounting firms. Their main results indicate that both professional training of assistants and external professional training are positively related to financial performance in large-sized firms. Next, they find a significantly positive association between internal training of assistants and financial performance in either large-, medium-, or small-sized firms. Finally, both external professional training of partners in large-sized firms and external professional training of assistants in small-sized firms are positively related to financial performance. Since the accounting industry involves human-intense and knowledge-intense, the quality of the human resources is a key factor in operations; however, the most direct method to enhance the quality of human resources is to enrich the staff's expertise and promote auditing quality through special education and training. Thus, this paper expects that

professional education and training can make a positive contribution to the performance of accounting firms. This paper defines the professional education and training (*PET*) as follows:

$$\text{Professional education and training } (PET) = \log[(\text{training expenditures} + \text{software and database fees}) \div \text{number of partners at the end of the year}]$$

The operational definitions of all the variables are summarized in Table II.

3.5 Multiple regression model

This paper explores the relationship between market share, international operations strategy and performance. As the data used in this paper is cross-sectional and as topics and discussion about the macroeconomics have not been included in this paper, factors such as inflation and time series have not been taken into consideration in the model design. In addition, after taking industry characteristics and the two variables (market share and membership of the group of international accounting firms or not) into consideration, this paper adds related control variables into the following empirical model:

Variables	*Mean*	*Median*	*Minimum*	*Maximum*	*SD*
	Panel A: international accounting firms ($n = 79$)				
MKA (unit: %)	7.97	7.41	2.89	24.43	3.62
MKNA (unit: %)	8.15	6.79	1.77	22.03	4.89
MKF (unit: %)	10.36	9.47	2.51	33.20	5.19
MKT (unit: %)	5.45	5.15	0.42	13.03	2.39
MKM (unit: %)	7.32	2.79	0.00	42.81	9.87
MKC (unit: %)	7.97	7.07	1.00	19.66	4.62
MS (unit: %)	8.05	7.60	2.74	23.56	3.53
	Panel B: non-international accounting firms ($n = 816$)				
MKA (unit: %)	0.42	0.33	0.00	2.19	0.36
MKNA (unit: %)	0.32	0.19	0.00	3.23	0.42
MKF (unit: %)	0.40	0.25	0.00	3.17	0.46
MKT (unit: %)	0.44	0.36	0.00	2.98	0.40
MKM (unit: %)	0.35	0.11	0.00	9.72	0.85
MKC (unit: %)	0.33	0.18	0.00	3.53	0.40
MS (unit: %)	0.40	0.30	0.00	2.06	0.35
Variables	*F-test of equal variance*	*p-value (two tailed)*	*t-test of mean*	*p-value (two-tailed)*	
	Panel C: *t*-test of independent sample				
MKA (unit: %)	820.89	<0.000	18.49	<0.000	
MKNA (unit: %)	1,067.86	<0.000	14.23	<0.000	
MKF (unit: %)	939.49	<0.000	17.06	<0.000	
MKT (unit: %)	549.05	<0.000	18.59	<0.000	
MKM (unit: %)	688.21	<0.000	6.27	<0.000	
MKC (unit: %)	1,261.37	<0.000	14.69	<0.000	
MS (unit: %)	859.16	<0.000	19.23	<0.000	

Notes: Variables are defined in Table I; *n* represents the number of samples

Table II.
Market share of accounting firms

$$\underset{\text{(Predicted sign)}}{PF} = b_0 + b_1 \underset{(+)}{MS} + b_2 \underset{(+)}{INTA} + b_3 \underset{(+)}{PERD} + b_4 \underset{(+)}{SCALE} + b_5 \underset{(-)}{BD} + b_6 \underset{(+)}{HC} + b_7 \underset{(+)}{PET} + e, \quad (3)$$

where:

PF	performance of accounting firms.
MS	individual accounting firm's market share.
INTA	international accounting firm = 1; non-international accounting firm = 0.
PERD	age of accounting firm.
SCALE	size of accounting firm.
BD	business diversification of accounting firm.
HC	human capital.
PET	professional education and training.
b_0	the intercept.
$b_1, b_2, b_3, b_4, b_5, b_6, b_7$	the parameters.
e	the error term.

4. Results and discussion

4.1 Descriptive statistics of market share of business services

Panels A and B in Table II show the market share of auditing, non-auditing, financial attestation, tax services, management consultant, corporate registration and other services revenues for international and non-international accounting firms. Comparing Panel A with Panel B, all the sub-market shares in international accounting firms are larger than those of non-international accounting firms. The *t*-test results in Panel C show that the average differences of all market share indicators reach a 1 percent statistically significant level. This implies that the international accounting firms have larger percentages of practice markets and market power than the non-international accounting firms, based on all business practices. The results also show that the international accounting firms possess a higher market share of financial attestation business ($MKF = 10.36$ percent) of the four sub-market shares. Non-international accounting firms possess a higher market share of the tax service business ($MKT = 0.44$ percent) of the four sub-market shares. Hence, it is apparent that international and non-international accounting firms demonstrate market segmentation in terms of their major clients.

In recent years, there has been a growth of international operations and development in the Mainland Chinese market of accounting firms' clients (Chien, 2005). This has meant that accounting firms often need to send employees to other countries to provide professional services to support of the needs of foreign clients. In general, only international accounting firms have the ability and expertise to do this. It seems that, in general, enterprises prefer to use international accounting firms when they need business assistance. Hence, international firms will have a higher market share than non-international accounting firms. This phenomenon further implies that

international accounting firms play a very important role in the auditing market and, in fact, dominate the auditing market.

4.2 Descriptive statistics and correlation coefficients of variables

Table III shows the descriptive statistical results of all variables. The mean of *PF* is NTD 2,034,416, showing that each partner can generate NTD 2,034,416 for the accounting firm. The maximum value is NTD 11,231,334. Regarding the independent variables, the mean of *MS* is 0.01, the maximum value is 0.24 and the sample is an international accounting firm. The mean of *INTA* is 0.09, showing that international accounting firms account for 9 percent of the total number of samples. Regarding the control variables, the mean of *PERD* is 15.79 years. The shortest history of any accounting firm is one year; the minimum value of the variable implies that it is a newly established accounting firm. The maximum value is 91 years, implying that the firm is a well-established accounting firm. The median number is 14 years, implying that more than half of the accounting firms have at least 14 years of experience.

The mean of *SCALE* is 114 employees and the maximum value is 2,001 employees, indicating that the firm is a large-scale accounting firm. The mean of *BD* is 0.44, the maximum value is 1, the minimum value is 0.26, and the median value is 0.42. These *BD* values are all above 0.25, indicating that more than half of the accounting firms focus on one or two business services. This indicates that they are more oriented to the business model of specialized services, and business diversification is not apparent. The mean of *HC* is NTD 466,821, showing that the average annual salary of each employee is NTD 466,821, and the maximum value is NTD 1,292,953, showing that the level of human capital of the accounting firm is considerable. The mean of *PET* is NTD 88,200, showing that the professional education and training expenditure of each partner of the accounting firm is NTD 88,200, and the maximum value is NTD 6,140,615, indicating that the accounting firms are concerned about the education, training and manpower quality of their professionals.

Table IV shows the correlation coefficient results of all variables. According to the Pearson correlation coefficients, other than the variables of *BD* and *PF*, which show an insignificant negative correlation, the independent and control variables *MS*, *INTA*, *PERD*, *SCALE*, *HC* and *PET* and *PF* are significantly and positively correlated at the 1 percent statistically significant level. The correlation coefficient value of *MS* and *PF* is 0.70; therefore, it is the independent variable with the highest correlation coefficient

Variables	Mean	Median	Minimum	Maximum	SD
PF (unit: NTD)	2,034,416	1,605,174	− 1,605,799	11,231,334	1,749,136
MS	0.01	0.00	0.00	0.24	0.02
INTA	0.09	0.00	0.00	1.00	0.28
PERD (unit: year)	15.79	14.00	1.00	91.00	10.22
SCALE (unit: number of staff)	114	42	2	2,001	233
BD	0.44	0.42	0.26	1.00	0.11
HC (unit: NTD)	466,821	442,548	30,090	1,292,953	200,052
PET (unit: NTD)	88,200	11,900	0	6,140,615	384,223

Notes: Variables are defined in Table I; the number of samples is 895

Table III.
Descriptive statistics of variables

Variables	*PF*	*MS*	*INTA*	*PERD*	*SCALE*	*BD*	*HC*	*PET*
PF	1.00	0.64** (0.000)	0.45** (0.000)	0.36** (0.000)	0.51** (0.000)	−0.07* (0.030)	0.60** (0.000)	0.40** (0.000)
MS	0.70** (0.000)	1.00	0.49** (0.000)	0.32** (0.000)	0.85** (0.000)	−0.08* (0.011)	0.36** (0.000)	0.40** (0.000)
INTA	0.67** (0.000)	0.89** (0.000)	1.00	0.36** (0.000)	0.49** (0.000)	−0.10** (0.004)	0.31** (0.000)	0.44** (0.000)
PERD	0.42** (0.000)	0.41** (0.000)	0.40** (0.000)	1.00	0.36** (0.000)	−0.04 (0.200)	0.36** (0.000)	0.14** (0.000)
SCALE	0.68** (0.000)	0.78** (0.000)	0.73** (0.000)	0.43** (0.000)	1.00	−0.07* (0.029)	0.35** (0.000)	0.42** (0.000)
BD	−0.05 (0.100)	−0.04 (0.211)	−0.07* (0.043)	−0.07* (0.026)	−0.10** (0.003)	1.00	−0.05 (0.100)	−0.07* (0.032)
HC	0.62** (0.000)	0.46** (0.000)	0.37** (0.000)	0.40** (0.000)	0.44** (0.000)	−0.07* (0.031)	1.00	0.31** (0.000)
PET	0.36** (0.000)	0.33** (0.000)	0.33** (0.000)	0.10** (0.002)	0.42** (0.000)	−0.08* (0.012)	0.30** (0.000)	1.00

Table IV.
Correlation coefficients of variables

Notes: Significant at: $^{*}p < 0.05$ and $^{**}p < 0.01$; variables are defined in Table I; the bottom left is the Pearson correlation coefficient, while the upper right is the Spearman correlation coefficient; the number of samples is 895

among all the independent and control variables. According to the Spearman correlation coefficient, *BD* and *PF* change from an insignificantly negative correlation of Pearson correlation to a significant correlation at the 5 percent statistically significant level, indicating that the performance of the accounting firm would be better if the business diversification level is higher (namely, the value of *BD* is smaller). The direction and significance of the results of the remaining independent and control variables and *PF* are consistent with the results of the Pearson correlation coefficient.

4.3 Regression analysis results

This section examines the relation between market share (*MS*) and performance (*PF*) in *H1* by employing total business revenues in the calculation of *MS* of the respective firms. Table V shows the regression results. In the table, *MS* and *INTA* variables are both significant and show a positive relation with *PF* ($p < 0.05$ and $p < 0.01$). Therefore, both *H1* and *H2* are supported. This indicates that accounting firms with higher market shares performance better. The finding is consistent with previous findings of researchers (Allen, 2006; Buzzell *et al.*, 1975; Buzzell and Gale, 1987; Falkenberg, 1984; Fraser and Hite, 1990; Sleuwaegen and Goedhuys, 2003; Stank *et al.*, 2003; Suzuki, 2000), and also supports the relationship model between market share and profitability proposed by Boulding and Staelin (1990).

In addition, the performances of international accounting firms are better than those of the non-international accounting firms. This is consistent with the previous findings of researchers (DeAngelo, 1981; Dopuch and Simunic, 1980; Moizer and Turley, 1989; Narasimhan and Chung, 1998). The bigger accounting firms usually have good reputations and better quality of auditing service than smaller ones. Therefore, the enterprises prefer to seek help and business services from bigger or international accounting firms, so that the company's financial and operating activities can be trusted by the community.

$$PF = b_0 + b_1 MS + b_2 INTA + b_3 PERD + b_4 SCALE + b_5 BD + b_6 HC + b_7 PET + e \quad (3)$$

Variables	Predicted sign	Coefficients
Intercept		-1.39^{***}
		(-5.34)
MS	+	8.26^{**}
		(2.27)
INTA	+	1.56^{***}
		(5.54)
PERD	+	6.18^{*}
		(1.54)
SCALE	+	8.31^{***}
		(6.31)
BD	−	3.16
		(0.97)
HC	+	3.04^{***}
		(14.34)
PET	+	3.78^{**}
		(1.82)
R^2		0.64
Adjusted R^2		0.64
F-statistics		227.893^{***}
Observations		895

Notes: Significant at: $^{*}p < 0.1$, $^{*}p < 0.05$ and $^{***}p < 0.01$, and the statistical significance level is determined using one-tailed *p*-values; variables are defined in Table I; the figures in parentheses are *t*-values; the heteroscedasticity has been adjusted by the White procedure (1980); the variable VIFs are less than 10, implying that no serious collinearity exists among the variables

Table V.
Regression results of relation between market share and performance

As to the control variables, Table V shows that the age of accounting firm (*PERD*), the size of accounting firm (*SCALE*), human capital (*HC*), and professional education and training (*PET*) are all significant in supporting positive relationships with *PF*, as expected. However, business diversification (*BD*) has an insignificantly positive relationship with *PF*; it is also inconsistent with the expected result. In addition, this paper uses the variance-inflation factor (VIF) to test the degree of collinearity among all the independent and control variables in the regression model. The VIF values of all independent and control variables are under 10, showing that there is no serious collinearity among them. In addition, R^2 and adjusted R^2 are both above 0.6. This implies that the fitness of the regression model is robust and good.

4.4 The determinants of market share and business service strategy from international accounting firms

Empirical results above indicate that there is a significantly positive relationship between *MS* and *PF*. According to the differentiated testing results of the mean of the market share indicators shown in Table II, international accounting firms have significantly higher means than non-international accounting firms in all the business market share indicators. Therefore, this paper focuses on samples of international accounting firms, and further analyzes the business service strategies of international accounting firms. In other words, in considering different types of businesses, which

types of business services should accounting firms develop and operate in order to maintain competitiveness and which is the business service that would offer competitive advantage and should get priority over the others? This paper expects to provide the theory, practical references and suggestions on operation management and business service strategy. Accordingly, this paper develops two regression models of business types that affect market shares of the accounting firms. First, total business is classified into auditing (*MKA*) and non-auditing business (*MKNA*); second, total business is classified into four divisions: finance attestation (*MKF*), tax service (*MKT*), management consultant (*MKM*), corporate registration and other services (*MKC*).

Based on this classification, this paper explores the relationship between *MKF*, *MKT*, *MKM*, *MKC* and *MS*; that is, to affirm the decisive factors of *MS*, and to further understand the determinants of the *MS* of international accounting firms. As the dependent variable (the *MS* value) is between 0 and 1, the Tobit regression model is used for analysis to determine the business services that have a greater impact on *MS* according to the variable coefficient. This can indicate the major sources of revenue for the accounting firms and identify the competitive advantage and niches of the accounting firms. Hence, this paper develops the following Tobit regression models to analyze the relationship between the *MS* and the sub-market shares of business services:

$$\underset{(\text{Predicted sign})}{\text{Model 1}} : MS = c_0 + c_1 \underset{(+)}{MKA} + c_2 \underset{(+)}{MKNA} + e_1, \tag{4}$$

$$\underset{(\text{Predicted sign})}{\text{Model 2}} : MS = d_0 + d_1 \underset{(+)}{MKF} + d_2 \underset{(+)}{MKT} + d_3 \underset{(+)}{MKM} + d_4 \underset{(+)}{MKC} + e_2, \tag{5}$$

where:

MS	market share of total business.
MKA	market share of auditing business.
MKNA	market share of non-auditing business.
MKF	market share of financial attestation business.
MKT	market share of tax business.
MKM	market share of management consultant business.
MKC	market share of corporate registration and other services.
c_0, d_0	the intercepts of Models 1 and 2, respectively.
c_1, c_2	the parameters of Model 1.
d_1, d_2, d_3, d_4	the parameters of Model 2.
e_1, e_2	the error terms of Models 1 and 2, respectively.

First, the empirical results of Model 1 shown in Table VI indicate that the coefficient value of *MKA* is 0.76, much higher than that of *MKNA*, 0.24. The difference indicates that *MS* of international accounting firms fall mainly under the control of auditing services. Second, Model 2 in Table VI shows that the coefficient value of *MKF* is the

$$\text{Model 1}: MS = c_0 + c_1 MKA + c_2 MKNA + e_1 \quad (4)$$

$$\text{Model 2}: MS = d_0 + d_1 MKF + d_2 MKT + d_3 MKM + d_4 MKC + e_2 \quad (5)$$

Variables	Predicted sign	Model 1	VIF	Model 2	VIF
Intercept		0.00*		−0.00*	
		(3.06)		(−2.31)	
MKA	+	0.76*	1.473		
		(150.33)			
MKNA	+	0.24*	1.473		
		(39.63)			
MKF	+			0.46*	1.483
				(40.83)	
MKT	+			0.39*	1.603
				(26.61)	
MKM	+			0.06*	1.603
				(17.86)	
MKC	+			0.12*	1.751
				(13.50)	
R^2		0.998		0.996	
Adjusted R^2		0.998		0.996	
Observations		79		79	

Notes: Significant at: $^*p < 0.01$, and the statistical significance level is determined using one-tailed *p*-values; variables are defined in Table I; the figures in parentheses are *z*-values; the heteroscedasticity has been adjusted by the White procedure (1980); the variable VIFs are less than 10, implying that no serious collinearity exists among the variables; the VIFs, R^2 and adjusted R^2 of Models 1 and 2 are derived from the general linear regression

Table VI. Regression results of determinants of market share of international accounting firms

highest, at 0.46, while the coefficient value of *MKT* is 0.39. The coefficient values of the remaining two business services are quite low. Therefore, from the perspective of business characteristics, *MS* is mainly subject to *MKF* and *MKT*. Thus, the international accounting firms mainly focus on the operation of traditional business services. *MKM* generates the lowest influence (0.06) on *MS*. The above empirical results show that international accounting firms' main business *MS* is traditional auditing services. The finance attestation and tax services bear special significance in the market share of the total business; this is because the international accounting firms mainly serve listed and OTC companies. The services most in demand from these companies are in the two traditional business categories. In addition, R^2 and adjusted R^2 of Models 1 and 2 are both above 0.9. The regression analysis yields a very high R^2 because the *MS* is explained with independent variables that are fractions of *MS*, which can result in a higher R^2.

This paper finds that the coefficient value of the management consultant business is the lowest among the four business types; however, this does not mean that this business category is not important to the accounting firms. The possible reason for this is that the accounting firms need to consider the requirements of independence in auditing financial statements and reports. In other words, when the accounting firm provides non-auditing services (or management consultant services) to its clients, it needs to assess the impact on its independence. The precondition of limitation is

necessary to avoid damaging its spirit of independence. As most of the clients of international accounting firms are listed or OTC companies, the auditing business is the most important and major business of the accounting firms. In consideration of the reputation and auditing quality of the accounting firms, they generally avoid providing excessive non-auditing services to the same client. In consideration of independency, in practice, clients that require non-auditing services such as management consultant services are referred to management consultant companies set up by the accounting firms. Furthermore, accounting firms and management consultant companies can form a strategic alliance to share and mutually recommend clients to the other (Chen and Lee, 2006). When clients need auditing services, they will seek the accounting firms for help; on the other hand, when clients need management consultant services, they can be referred to the associated management consultant company for help (Chen and Lee, 2006). Accordingly, for international accounting firms, the impact on the total business market share is relatively lower for management consultant services compared to other businesses.

Nevertheless, the management consultant business is a professional service yet to be developed and actively operated in the future. Many companies are in urgent need of a management consultant service. If the accounting firms, which are most familiar with the business operating conditions and health of the company, can provide such services this would save time and cost to the companies when looking for appropriate management consultant firms and could enhance the relationship between accounting firms and other companies. When the accounting firms provide management consultant, the maintenance of their independence should be taken into consideration. In this paper, the accounting firms can offer more concrete suggestions for substantial improvement according to the strengths and weaknesses of the company's business operations and financial conditions found during the auditing process and help companies to plan operating strategies and directions for the future. As the auditing market has been saturated, this paper suggests that the accounting firms may actively expand in the management consultant business in the future, and can also develop their own niche and competitive advantage in the highly competitive traditional auditing services.

5. Conclusions

This paper aims to explore the impact of market share on the performance of accounting firms and to answer the question of whether the performance of international accounting firms is better than that of non-international accounting firms. Empirical results show that a significantly positive relationship exists between market share and performance. Results also show that the performance of international accounting firms is better than that of non-international accounting firms. The control variables, *PERD*, *SCALE*, *HC* and *PET*, are all significant, showing positive relationships with performance.

Higher market shares of accounting firms means larger companies and stronger monopolization. In comparison with other large accounting firms, the international accounting firms can provide more diversified and specialized auditing and non-auditing services with their greater workforce and specialized divisions. In this way, they can meet the demands of businesses and clients. As a result, customer loyalty to and trust in the accounting firms will also be increased and performance improved. In addition, accounting firms can more clearly understand the demands of clients and potential markets based on the market share of each accounting firm and

that of the business service. From the clients' viewpoint, market share is one of the key indices in determining the quality of the services of accounting firms.

Second, to further understand the relationships between the market share of the total business and that of the sub-markets of international accounting firms, and confirm the determinants affecting market share of total business, this paper classifies total business into auditing and non-auditing businesses. These fall into four specific divisions: financial attestation, tax, management consultant, corporate registration and other business services; this paper then constructs the Tobit regression models between market shares of sub-markets and market share of total business. Empirical results show that the market share of the total business of international accounting firms falls mainly under the control of auditing services. In addition, from the perspective of business characteristics, empirical results show that most parts of the international accounting firms' market share is a result of traditional auditing services, especially in finance attestation and tax services; however, management consultant services contribution the least to market share. Nevertheless, this paper finds that the average annual revenues from the management consultant service provided by international accounting firms have increased, year by year, indicating that more businesses are seeking management consultant services.

In addition to the auditing services for many listed companies, the large accounting firms also provide diversified management consultant services, including corporate governance, risk control, M&A issue, transnational operations, establishment of factories, and taxation systems of different countries. Furthermore, many Taiwanese companies have expanded their businesses into Mainland China; thus, the demand for transnational and the services of consultants for local taxation has increased. For example, the clients of the international accounting firms in Taiwan are mostly large public or OTC listed companies that urgently require management consultant services. Since the auditing market in Taiwan has reached a saturated state, the future accounting industry will incorporate non-auditing services. It is suggested that the large accounting firms can follow the demand changes of their clients, employ professionals in various fields to provide specialized services, adjust the range of transnational and management consultant services and operate such services more aggressively. These measures will have the advantage of strengthening the competitiveness of the large accounting firms, allowing them to create their own niches in a fiercely competitive market.

Future research can focus on the following four directions. First, the performance of accounting firms can be considered and measured through different performance indicators, and future relevant theoretical bases can be applied. For example, balanced scorecard (BSC) or intelligence capital (IC) can be applied to develop foundations for a measurement of a multiple performance indicators. Second, the interaction effect of the model independent variables and control variables can be considered in the regression model to discuss the effect of interaction between the variables on the performance of accounting firms. Third, independent variables can be taken into account in the business strategy and client attributes. The managers should select the business models that are suitable for the accounting firms, and the business services appropriate for different marketing strategies and client attributes, to give the accounting firms a competitive advantage. This is an important issue. Fourth, for the research design, the data envelopment analysis (DEA) or other methods can be used to discuss and evaluate the efficiency value resulting from the relationship between multiple input variables

and multiple performance indicators. Using the regression analysis, multiple methods can thus be used. With design and innovation from different research methods, the practical implications and business performance evaluation can be more insightful and rigorous.

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