Competition and Sustainability: Evidence from Professional Service Organization

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Abstract: Two professional service organizations, an auditor and a tax agent, provide services to the same target clients. Taiwan established a new regulatory system for tax agents in 2004, which directly enhances their ability to compete with auditors. From the perspective of the economic theory of regulation, this study investigates the indirect effects of the new regulatory system on the business of auditors. We focus on auditors in proprietorship audit firms and divide the sample period into before and after 2004. This study establishes a cross-sectional regression equation to test our hypotheses. We classify the types of business into three levels, total amount, three categories and six individual items. Based on the 1989–2017 Survey Report of Audit Firms in Taiwan, we find that auditors perform better after 2004, indicating that increased competition leads to positive sustainability for auditors. Further results show that the effects of the regulation on auditors' performance are greater after 2004, additional evidence of the positive indirect effect on auditors. This study contributes to the literature, provides public policy implications to regulators and contributes managerial information to auditors.

Keywords: competition; sustainability; auditors; tax agents; proprietorship audit firms

1. Introduction

Auditors and tax agents are two professional service organizations providing accounting and tax services to small and medium-sized enterprises in Taiwan. Because of a lack of uniform examination and licensing, tax agents have been referred to as underground auditors over the past five decades. To establish a sound accounting and tax return system, Taiwan passed the Certified Public Bookkeepers Act (hereafter, the ACT) in 2004. The ACT authorizes licenses for tax agents as certified public bookkeepers and enhances their ability to compete with auditors for accounting and tax services.

Auditors and tax agents have had the same target clients, small and medium-sized enterprises, for the past half-century. In theory, the ACT positively benefits tax agents and has indirect effects on auditors. What is this effect, positive or negative, on auditors? The regulation for tax agents in Taiwan creates a unique scenario for us to investigate its indirect effects on auditors. The answers are critical to regulators and professional service organizations such as auditors in Taiwan and other countries. Except Yu (2005) [1] and Chen et al. (2010) [2], few prior researchers examine this topic and investigate the indirect effects of regulation. Both Yu [1] and Chen et al. (2010) [2] investigate the effects of the ACT on the business of audit firms after 2004. They find that the impacts of the ACT on audit firms are either limited or moderate. To fill the research gap, this study examines the issue before and after the ACT and the indirect effects of the ACT on the business and operating performance of audit firms.

From the perspective of the economic theory of regulation (ETR) and competitive strategy theory, this study's main hypothesis is that the ACT has a positive effect on auditors, i.e., competition leads to sustainability for auditors. To test the hypothesis, this study examines the association between

non-audit services and the operating performance of auditors before and after the ACT. The empirical data of auditors are from the 1989–2017 Survey Report of Audit Firms in Taiwan, published by the Financial Supervisory Commission of the Executive Yuan. Because auditors in proprietorship audit firms have the same target clients as tax agents, we focus on them to test the indirect effects of the ACT. We define the years before 2004 as the pre-ACT period, and the years after 2004 as the post-ACT period. Because auditors and tax agents render services to the same target clients, this study defines these services as overlapping businesses. To further understand the effects of the ACT on the specific business of audit firms, we classify the overlapping businesses into three levels, total amount, three categories and six individual items. Total amount is defined as the total revenues of the non-audit services. Three categories include tax-related services, consultation services, and registration and accounting services. Six individual items are composed of tax planning, tax administrative remedies, other tax, management advice, corporate registration, and accounting and bookkeeping services. Because overlapping businesses are also referred to as non-audit services and auditors are also referred to as audit firms, we interchangeably use these terms hereafter.

In total, we obtained a positive indirect effect of the regulation on auditors. Specifically, the effects of ACT on the operating performance of proprietorship audit firms are greater in the post-ACT period. This study's results add brand new knowledge to the economic theory of regulation (ETR), i.e., regulation directly benefits the regulated and indirectly benefits competitors. In practice, competition creates a favorable development for auditors. Having a competitive marketplace with several similar services available for clients, auditors can adopt a competitive strategy to achieve an above average position. One feasible method is rendering superior quality and value-added services. This will enable auditors to charge premium prices to cover higher cost and create a sustainable competitive advantage. In addition, we provide public policy implications to regulators and contribute useful managerial information to the practitioners (auditors). Following this section, Section 2 reviews the relevant literature and develops our hypotheses, Section 3 describes the research method, and Section 4 presents the empirical results. The conclusions and discussion are given in Section 5.

2. Literature Review and Hypothesis Development

2.1. Regulation of the Public Accounting Profession

The regulation of the public accounting profession in the US comes from three regulatory bodies, including the American Institute of Certified Public Accountants (AICPA), the Securities and Exchange Commission (SEC), and the Financial Accounting Standards Board (FASB). The AICPA set up the Institute's Committee on Accounting Procedure (CAP) in 1938 to publish generally accepted accounting principles (GAAP), known as Accounting Research Bulletins. The CAP was replaced by the Accounting Principles Board (APB) in 1959 to take charge of issuing pronouncements on GAAP, known as Opinions. To have an independent accounting standard-setting body, a private, non-profit organization, FASB, was established in 1973. Since then, FASB has been the source of GAAP and issued a series of accounting standards, including the Statement of Financial Accounting Standards, FASB Interpretations, and FASB Technical Bulletins. The SEC designates the FASB as the organization responsible for setting accounting standards for public companies in the US [3].

In December 2001, Enron filed for bankruptcy, soon after acknowledging that accounting irregularities had been used to significantly inflate earnings in the current and preceding years. Shortly thereafter, it was disclosed that WorldCom had used accounting fraud to significantly overstate its reported income. Investors questioned the effectiveness of financial audits, leading to a crisis of credibility for the public accounting profession [4]. The Enron and WorldCom cases elicited a prompt response from a number of congressional committees, the Securities and Exchange Commission (SEC), and the United States Justice Department. The US Congress passed the Sarbanes-Oxley Act in the summer of 2002 and created the Public Company Accounting Oversight Board (PCAOB) to oversee the public accounting profession. The PCAOB was given broad powers to develop and enforce

accounting standards for audit firms that audit the financial statements of SEC-registered companies. The establishment of the PCAOB eliminates a significant portion of the public accounting profession's system of self-regulation, and regulation of the profession, at least with respect to the audit of public companies, is no longer primarily in the hands of the profession.

The economic theory of regulation (ETR) assumes that individuals and groups take action out of self-interest when attempting to induce a government to use its powers for their benefit [5–7]. The ETR further recognizes that governments hold the power to selectively help or hinder different components of society (e.g., industries and occupations), and various competing groups lobby the government for their own benefit [8]. In terms of accounting regulations in the US, these groups include government officials, the State Board of Accountancy, the State Society of Certified Public Accountants, and educators. They attempt to influence regulators through lobbying efforts, political contributions, and the offering of votes. Those entities providing regulators with the greatest political support are likely to have their interests met [8].

Although consumers can potentially benefit from some level of regulation, the providers of a service might be the primary beneficiaries of stricter regulation [9]. For example, unnecessary educational requirements and arduous reciprocity provisions for practitioners from different jurisdictions can serve as entry barriers and can reduce consumers' access to services and increase fees [8]. Information asymmetry exists when a service provider is knowledgeable about his or her area of expertise, but the consumer is unable to evaluate the service quality [10]. Because audit quality is difficult to assess, minimum quality standards in the form of auditors' license restrictions can potentially benefit clients by ensuring that only individuals who meet the minimum standards are permitted to conduct audits.

Internal audit outsourcing was a consulting service in 1990 but the US Congress identified it as a service that was incompatible with the independence of auditors in 2002. In a 12-year review, Caplan et al. (2007) [11] examined the accounting profession's self-regulation with respect to the question of whether auditors compromise their independence when they provide internal audit services to their attestation clients. The effects of regulation on the exit of small audit firms from the audit market following the SEC regulation provide important evidence for public policy development. Previous research did not find that small audit firms exiting the market for SEC client audits were of lower quality than successor small audit firms that did not exit the market [12]. In addition to increased litigation against auditors and higher insurance costs, the Enron case resulted in increased regulatory review of the auditing profession and of auditors. Fargher and Jiang (2008) [12] examined auditors' propensity to issue going-concern opinions after changes in the audit environment. Based on 6377 observations from Australian publicly listed companies for the period 1998–2005, they found increased auditor conservatism after the crisis period, that is, auditors identified more financially stressed companies, with more companies expecting to receive a going-concern opinion.

2.2. Background and Regulation of Tax Agents in Taiwan

To establish a sound accounting and tax return system, the Taiwanese Executive Yuan issued a regulation draft for tax agents in 1998. The draft was warmly welcomed by tax agents and they held a parade in September 1998 to promote the enactment. However, auditors were deeply concerned about the services tax agents can provide in the draft. Some auditors in proprietorship audit firms argued that there was over eighty percent business overlap between the services provided by tax agents and by auditors. Accordingly, due to their anxiety over these overlapping businesses, auditors also marched to demonstrate their position regarding the draft in October 1998. These two parades are unique regarding professional service organization in Taiwan. After seven years of deliberation, the Legislative Yuan passed the Tax Agent Act in 2004. Since then, tax agents are a legal professional service organization in Taiwan. Article 13 of the ACT stipulates the services which tax agents can offer. It includes three major categories of services: tax-related services, consultation services, and registration and accounting services [13].

Prior to the Act, relevant research focused on the legal aspects or on making suggestions to the regulators, such as Ma (1998) [14], Liu (1998) [15], and Yang (1999) [16]. Before the passage of the Act, Yang [17,18] examined the situation of tax agents in Taiwan, collecting information by questionnaire and interview. Their findings provide implicative information for lawmakers and regulators in their policy decision-making concerning the enactment of the ACT. After the first year of the ACT, Yu [1] investigated the effects of the ACT on the businesses of audit firms and tax agents by questionnaire survey. Yu (2005) [1] found that the ACT benefitted tax agents in their rendering of accounting and tax-related services. However, the ACT had a limited impact on small-sized audit firms.

Based on a questionnaire survey of over 251 audit firms, Chen et al. (2010) [2] indicated that the ACT adversely affected audit firms either slightly or moderately. Both auditors and tax agents have provided non-audit services to small and medium-sized enterprises over the past decades. Auditors thus perceive the effects of the ACT on their businesses as either slight or moderate. Furthermore, the degree of severity of these adverse effects on non-audit services is highest for small-sized audit firms [12]. Particularly, proprietorship audit firms are most negatively affected by the ACT. The questionnaire respondents of Chen et al. (2010) [2] were auditors. When answering the questions, they tended to exaggerate their negative perceptions due to crisis awareness and their own self-interest. A similar situation arises in the case of import relief in the USA. Import relief through tariffs, quotas, marketing agreements, or federal adjustment assistance is a wealth transfer process; that is, an increase in import protection leads to a wealth transfer from domestic consumers, domestic importers, and foreign suppliers to domestic producers of the protected goods. In the USA, import relief is determined by the International Trade Commission (ITC) and is based on several factors, such as the profitability (earnings) of the domestic producers. The ITC does not adjust financial data when making its import relief decisions, so in this situation the best policy for domestic producers is to report lower earnings. Managers thus have an incentive to manage earnings in ways that increase the likelihood of obtaining import relief or increase the amount of relief granted. Jones [19] examines whether firms benefiting from import relief attempt to decrease their earnings through earnings management during import relief investigations, and finds that they do so.

In terms of competitive strategy theory, companies can utilize marketing strategies, product differentiation, product innovation, and overall cost leadership to achieve sustainable competitive advantage and earn an abnormal rate of return in a hostile environment [20,21]. Given various product differentiation alternatives, superior quality is the most frequently adopted approach [22]. Superior quality insulates a product from rivalry by lowering customer sensitivity to price and protecting the product from other competitive forces that reduce price-cost margins [21]. High-quality products allow companies to avoid price-based profit-damaging competition [23] and enable companies to charge premium prices and generate superior profit margins [21,24,25]. Previous studies have supported the above arguments and report that product quality is positively associated with financial performance [26].

Given the increased competition from tax agents for non-audit services after 2004, the best policy for auditors is that of service quality improvement. With skillful and experienced auditors and long-term partnerships with clients, audit firms provide quality services in order to earn premium fees, which serves either as an incentive to continuously render quality service or as a return on their investment in terms of reputation. Based on the economic theory of regulation (ETR) and competitive strategy theory, this study assumes that the ACT will provide incentives for auditors to upgrade their service quality, resulting in superior operating performance. Although the ACT results in increased competition for auditors, it brings about positive effects and sustainable development. Hence, we establish the following hypothesis:

Hypothesis 1 (H1). *Operating performance of proprietorship audit firms in the post-ACT period is better than that in the pre-ACT period.*

2.3. Overlapping Businesses: Non-Audit Services

Overlapping businesses between auditors and tax agents are referred to as non-audit services, a long standing type of business in the public accounting profession. Proponents of auditors' provision of non-audit services claim that joint provision of audit and non-audit services theoretically create synergies of knowledge spill-over for audit firms [5,27,28]. Furthermore, Eilifsen and Knivsfla (2016) [28] found that knowledge spill-over from non-audit services may improve the audit quality of smaller audit firms. Opponents, however, assert that providing non-audit service increases auditors' economic dependence on clients and, hence, may impair auditor independence [29–34].

In fact, provision of non-audit services enhances the auditors' understanding of clients and strengthens their ability to improve audit quality without compromising the independence of auditors [35]. Audit procedures must be appropriate, irrespective of the presence of non-audit service engagements. Regulators must therefore ensure that auditors' apparent and actual independence is not impaired. When auditor independence is appropriately secured, audit-related and some non-audit services may increase the actual and perceived benefits of audit [36].

Audit firms offer non-audit services such as tax-related services, registration and accounting services, personal financial planning, information technology (IT), e-commerce advisory services, and business valuation [37]. In long-term partnerships and close client relationships, audit firms gain a more favorable position when providing non-audit services than an ordinary professional consulting firm such as McKinsey & Company.

Insightful and comprehensive experience of the provision of non-audit services may improve auditors' ability to deliver higher audit quality through knowledge spill-over or economies of scope [38]. When audit quality is improved, the operating performance of audit firms is also improved. The Economics literature and the theory of knowledge spill-over state that efficiency can be gained from the joint provision of audit and non-audit services [39]. Banker et al. (2005) [40] state that the profitability of audit firms has been sustained in recent years largely by the impact that non-audit services have had on their productivity. Beginning in the 1990s, auditors began to move their businesses from the traditional, low-margin product areas of auditing and accounting into the relatively new, high-margin product areas of non-audit services [41,42]. Prior research found that non-audit services lead to subsequent improvements in operating performance and reductions in operating risk [43].

Based on previous research, we expect that non-audit services contribute positively to the operating performance of audit firms. Via the three-level classification of non-audit services, this study forms the following hypotheses:

Hypothesis 2a (H2a). *Association between total non-audit services and operating performance of proprietorship audit firms is positive.*

Hypothesis 2b (H2b). *Association between the three categories of non-audit services and operating performance of proprietorship audit firms is positive.*

Hypothesis 2c (H2c). *Association between the six individual items of non-audit services and operating performance of proprietorship audit firms is positive.*

Over the past five decades, tax agents have served small and medium-sized enterprises under executive orders issued by the Taiwanese Ministry of Finance and the Ministry of Economic Affairs. Tax agents practicing before 2004 could either take the uniform examination or participate in annual professional training to meet the requirement. After 2004, the uniform examination became the only way to qualify as a practitioner. The passing of the ACT entitled tax agents to deliver services as a legal professional service provider.

In the context of an operating environment, this study assumes that the passing of the ACT will benefit tax agents but will encourage auditors to improve service quality in their provision

of non-audit services. In terms of competitive strategy theory, high service quality results in high customer satisfaction, which in turn implies high loyalty of current customers, low price elasticity, and insulation of current customers from competitive efforts [21,25]. This leads to the potential for auditors to attract new customers due to their enhanced reputation and, therefore, to high revenue potential [43–46]. Increased competition in the operating environment spurs auditors to develop a sustainable competitive advantage. As we postulate a positive effect of regulation on auditors, we expect that non-audit services will contribute more to the operating performance of proprietorship audit firms in the post-ACT period. We hypothesize:

Hypothesis 3a (H3a). *Effect of total non-audit services on the operating performance of proprietorship audit firms is higher in the post-ACT period.*

Hypothesis 3b (H3b). *Effect of the three categories of non-audit services on the operating performance of proprietorship audit firms is higher in the post-ACT period.*

Hypothesis 3c (H3c). *Impact of the six individual items of non-audit services on the operating performance of proprietorship audit firms is higher in the post-ACT period.*

3. Methodology

3.1. Sample Selection

This study obtained empirical data on proprietorship audit firms from the 1989–2017 Survey Report of Audit Firms in Taiwan, published by the Financial Supervisory Commission (FSC), equivalent to the SEC in the US. The FSC administers the survey across all registered audit firms annually to collect business information on the public accounting profession for macro-economic analysis and industrial policy development. The contents of the survey include quantitative information on total revenues and their composition, total expenses and their composition, and the demographics of various levels of auditors. Since the FSC administers the survey pursuant to the Statistics Act, it requires the surveyed audit firms to complete the questionnaire correctly before the due date. The Survey Report generates an annual response rate of over 80%.

To ensure the confidentiality of business transactions, the FSC provides no specific information on individual audit firms. Hence, the samples used in this study are pooled cross-sectional data which combine both cross-sectional and time-series information [47]. In recent years, more and more studies use pooled cross-sectional data because this enables researchers to exploit the entire available sample. In contrast to yearly estimates, results from pooled cross-sectional data reflect the mean effects of independent variables during the sampling period; thus, statistics obtained from the pooled data are more accurate [48]. However, pooled cross-sectional data suffers from the econometric problem of correlation between residual terms. High correlation between residual terms violates the independence assumption in a linear regression model. To check the independence assumption, this study conducts the Durbin-Watson (DW) test for verification and obtains DW values located between 1.33 and 2.19. Because the values are near 2, it implies a low correlation between residual terms and no violation of independence assumption [49]. Excepting the year 1991, the sample period of this study totals 28 years, all monetary variables are deflated by the yearly Consumer Price Index to account for inflation, and the year effects are controlled accordingly. The final sample consists of 13,642 audit firm-year observations.

3.2. Empirical Model

The structure-conduct-performance (S-C-P) theoretical framework from the industrial organization literature states that market structures affect the conduct of firms and further affect firms'

performance [50,51]. Based on the S-C-P framework, this study establishes the following cross-sectional regression equation to test our hypotheses:

$$Perform = \beta_0 + \beta_1 \, Act + \beta_2 \, Overlap + \beta_3 \, Act * Overlap + \beta_4 \, Workexp + \beta_5 \, Edulevel + \beta_6 \, Marksh + \beta_7 \, Firmnum + \beta_8 \, Training + \beta_9 \, GDP + \varepsilon$$

where Perform is operating performance. *Act* is 1 if the year is after 2004 and 0 otherwise. *Overlap* is either total of non-audit services, three categories of non-audit services, or six individual items of non-audit services. *Workexp* is work experience of auditors. *Edulevel* is education level of auditors. *Marksh* is annual market share of proprietorship audit firms. *Firmnum* is annual number of proprietorship audit firms. *Training* is training expenses in an audit firm. *GDP* is annual Gross Domestic Product in Taiwan. ε is error term. In examining the indirect effects of regulation on auditors, we assume that the effect is positive and the coefficients of β_1, β_2 and β_3 are predicted to be positive.

In practice, audit quality significantly affects the operating performance of audit firms. Previous researchers identified some key determinants or drivers of audit quality, such as the education level of auditors [52,53], the professional training of auditors [54,55], and the work experience of auditors [55,56]. Our regression equation above includes audit quality drivers as control variables and is an audit-quality-controlled model.

3.3. Variable Definitions

This study defines the dependent variable, operating performance as the total operating profit of a proprietorship audit firm. Accounting defines operating profit as total revenues minus total expenditures. Partners are the owners and residual interest claimants of an audit firm. Their annual incomes include salaries and shares in the operating profit of the firm. Partners' salaries are a component of the operating expenses of the firm; the higher the salaries the partners receive, the less operating profit the firm has. Relevant Taiwanese laws and regulations require the allocation of audit firms' operating profit to the owners annually and prohibit the audit firms from keeping operating profits as retained earnings; thus, it makes no difference to partners whether they receive salaries or not in terms of their total annual income. In addition, the criteria for salary payments to partners vary across firms. Based on previous studies [57], partners' salaries are added back into operating profit to reduce such artificial noise. Because there is only one partner in a proprietorship audit firm, this study defined financial performance (*Perform*) as operating profit plus salaries of the sole partner deflated by one.

The dummy variable of the time period, Act, is defined as 1 if the year is after 2004 and 0 otherwise. Non-audit services are defined by three levels. The first level is the total of non-audit services (*Nonaudit*), defined as the total revenues from all non-audit services. Based on Article 13 of the ACT, we decompose total non-audit services into three categories: tax-related (*Taxes*), consultation (*Consul*), and registration and accounting services (*Registacc*). The third level includes the six individual items of non-audit services, including tax planning (*Taxplan*), tax administrative remedy (*Admrem*), other tax (*Othertax*), management advice (*Mangadv*), corporate registration (*Corpreg*), and accounting and bookkeeping services (*Accbook*).

Based on previous research, this study includes some control variables in the equation, such as Gross Domestic Product (*GDP*) [58], annual market share of each proprietorship audit firm (*Marksh*) [57,59–61], training expenses in an audit firm (*Training*) [57,62–64], work experience of auditors (*Workexp*) [57,59,65], education level of auditors (*Edulevel*) [59,65,66], and total number of audit firms each year (*Firmnum*) [50,51].

4. Results

4.1. Descriptive Statistics

Table 1 displays the descriptive statistics and comparisons of the research variables for the sample period. To save space, we show the results for the dependent and research variables but have omitted

control variables. As can be seen in Panel A, the mean operating performance (*Perform*) is $846,164. The mean revenues of total non-audit services (*Nonaudit*) are $1,493,981. The mean revenues from the three categories of non-audit services are $53,557 for tax-related services (*Taxes*), $679,808 for consultation services (*Consul*), and $760,616 for registration and accounting services (*Registacc*). For the six individual items of non-audit services, the results are $28,822 for tax planning (*Taxplan*), $24,734 for tax administrative remedy (*Admrem*), $430,648 for other tax (*Othertax*), $249,159 for management advice (*Mangadv*), $221,559 for corporate registration (*Corpreg*), and $539,057 for accounting and bookkeeping services (*Accbook*).

Table 1. Descriptive statistics and comparisons of research variables.

	Mean	Median	Std. Dev.	Mini	Maxi.	Q1	Q3
			Panel A Descriptive statistics				
Perform	846,164	609,881	1,008,891	−5,270,741	19,067,226	186,976	1,229,093
Act	0.51	1	0.5	0	1	0	1
Nonaudit	1,493,981	814,949	1,996,071	0	76,135,849	218,110	2,076,359
Taxes	53,557	0	379,838	0	8,124,630	0	0
Consul	679,808	43,890	1,351,113	0	24,546,904	0	729,152
Registacc	760,616	249,956	1,480,854	0	75,471,698	54,372	830,163
Taxplan	28,822	0	275,982	0	7,341,619	0	0
Admrem	24,734	0	243,734	0	7,521,083	0	0
Othertax	430,648	0	1,102,528	0	14,574,367	0	117,048
Mangadv	249,159	0	808,809	0	24,546,904	0	101,074
Corpreg	221,559	102,291	380,957	0	7,754,280	12,841	278,117
Accbook	539,057	0	1,387,752	0	75,471,698	0	470,929
			Panel B Comparisons of research variables				

	Post-ACT periods (A)	Pre-ACT periods (B)	Differences (A-B)	t-statistics
Perform	830,140	862,631	−32,491	−1.881
Nonaudit	1,620,387	1,364,080	256,306	7.513 ***
Taxes	49,717	57,502	−7784	−1.197
Consul	819,786	535,959	283,827	12.335 ***
Registacc	750,882	770,619	−19,737	−0.778
Taxplan	30,450	27,148	3302	0.699
Admrem	19,267	30,354	−11,087	−2.657 ***
Othertax	620,253	235,802	384,451	20.678 ***
Mangadv	199,533	300,157	−100,624	−7.279 ***
Corpreg	185,374	258,744	−73,370	−11.298 ***
Accbook	565,508	511,875	53,633	2.257 **

Notes: 1. Total number of observations for the sample period is 13,642, consisting of 6728 in pre-act period and 6914 in post-act period; 2. Variable definitions: Perform = operating performance; Act = 1 if the year is after 2004 and 0 otherwise; Nonaudit = total non-audit services; Taxes = taxes related services; Consul = consulting services; Registacc = registration and accounting services; Taxplan = taxes planning services; Admrem = taxes administrative remedy services; Othertax = other taxes services; Mangadv = management advisory services; Corpreg = corporate registration services. 3. *, **, *** denote significance at the 10%, 5%, and 1% level for two-tailed test.

Panel B shows the differences in our research variables between the pre-ACT and post-ACT periods. As shown, the operating performance (*Perform*) in the post-ACT period is lower than that in the pre-ACT period, but not significant. Total non-audit services (*Nonaudit*), consultation services (*Consul*) other tax services (*Othertax*), and accounting and bookkeeping services (*Accbook*) in the post-ACT period are significantly higher than in the pre-ACT period. Next, tax administrative remedy (*Admrem*), management advice (*Mangadv*), and corporate registration (*Corpreg*) services in the post-ACT period are lower than those in the pre-ACT period. However, tax-related (*Taxes*), registration and accounting (*Registacc*), and tax planning (*Taxplan*) services differ insignificantly between post-ACT and pre-ACT periods.

4.2. Regression Results

The main results are displayed in Table 2. We estimate the standardized regression coefficients for each independent variable to ease comparisons between variables. Standardised coefficients possess attributes similar to correlation coefficients, with values lying between −1 and +1. The higher absolute value of standardised coefficients predicts more variations in the dependent variable. In the OLS standardised regression model, no intercept exists. All the t-statistics for the variable coefficient are calculated using Kennedy (1998) [67] robust standard error to correct for heteroscedasticity. As a robustness check on multi-collinearity between independent variables, we estimate the variance inflation factors (VIFs) in the regression models. The VIF for independent variable Xi was defined as 1/(1-RSQi), where RSQi was the R^2 from the regression of Xi on the remaining k-1 predictors. If Xi was highly correlated with the remaining predictors, its VIF was very large. In econometrics, a VIF greater than 10 implies serious multi-collinearity between independent variables [68].

Table 2 displays the regression results for the association between non-audit services and the operating performance of proprietorship audit firms, with Panel A for control variables, Panel B for total non-audit services, Panel C for the three categories of non-audit services, and Panel D for the six individual items of non-audit services. Panel A includes control variables and will be used as a benchmark for subsequent comparisons. To save space, Panels B, C, and D display the results for research variables only.

Panel B shows the results for total non-audit services. The adjusted R^2 was 0.406 in Panel A and rose to 0.461 in Panel B. As shown in Panel B, the research variable is the dummy variable of the time period (*Act*), which appeared in two items, as itself and as the interaction term *Act * Nonaudit*. In econometrics, the interaction term should be taken into account when determining the relationship between the *Act* and performance; thus, this study takes a first-order differentiation over *Act* in Panel B with a value of 319,712 (−0.202 + 0.214 * 1,493,981). The positive figure supports H1: operating performance of proprietorship audit firms in the post-ACT period is better than that in the pre-ACT period. The results show that the ACT brings about positive effects on auditors. The research variable, *Nonaudit*, has a positive coefficient (t = 8.589), representing the association between total non-audit services, and operating performance of proprietorship audit firms is positive. Consistent with expectation, this lends support to H2a.

The interaction term *Act * Nonaudit* is significantly positive (t = 21.401) and this result supports H3a: effect of total non-audit services on the operating performance of proprietorship audit firms is higher in the post-ACT period. Given the positive indirect effect of regulation on auditors, H1, the positive coefficient on the interaction term indicates that non-audit services contribute more to the operating performance of proprietorship audit firms in the post-ACT period. This constitutes further evidence of the positive indirect effect of the ACT on auditors.

Panel C shows the results of the three categories of non-audit services. Because the research variable, *Act*, appeared in four items, *Act*, *Act * Taxes*, *Act * Consul* and *Act * Registacc*, this study takes a first-order differentiation over *Act* in Panel C and has a value of 193,608 (193,608 = −0.185 − 0.017 * 53,557 + 0.106 * 679,808 + 0.161 * 760,616). The positive figure sends to support H1: operating performance of proprietorship audit firms in the post-ACT period is better than that in the pre-ACT period. Except for the research variable of *Registacc*, the coefficients of the research variables *Taxes* and *Consul* are positive (t = 10.919 and 13.713), lending support to H2b: the association between tax related services and consultation services and the operating performance of proprietorship audit firms is positive.

The interaction term, *Act * Taxes*, is significantly negative, as shown in Panel C (t = −1.956). Inconsistent with expectation, this result does not support H3b and indicates that the effect of tax-related services on the operating performance of proprietorship audit firms is not higher in the post-ACT period.

Next, the interaction term of *Act * Consul* is significantly positive (t = 9.922), indicating that consultation services in the post-ACT period contribute more to operating performance than in

the pre-ACT period. This result supports H3b: the effect of consultation services on the operating performance of proprietorship audit firms is higher in the post-ACT period. Finally, the interaction term of *Act * Registacc* is significantly positive, as shown in Panel C (t = 18.541). H3b is supported: the effect of registration and accounting services on the operating performance of proprietorship audit firms is higher in the post-ACT period. In sum, both consultation services and registration and accounting services provide further evidence to support our postulation that the effect of ACT on auditors is positive.

Table 2. Regression results between non-audit services and performance.

Panel A Control variables		
$Perform = \beta_0 + \beta_1\ Workexp + \beta_2\ Edulevel + \beta_3\ Marksh + \beta_4\ Firmnum + \beta_5\ Training + \beta_6\ GDP + \varepsilon$		
Variables	**Standardized Coefficients**	**t-statistics**
Workexp	−0.022	−3.255 ***
Edulevel	0.012	1.709 *
Marksh	0.699	93.777 ***
Firmnum	0.043	2.486 **
Training	0.037	5.389 ***
GDP	0.233	13.224 ***
Adjusted R^2	0.406	
F-statistic	1557 ***	
Durbin-Watson	1.933	
Panel B Total non-audit services		
$Perform = \beta_0 + \beta_1\ Act + \beta_2\ Nonaudit + \beta_3\ Act*Nonaudit + Control\ Variables + \varepsilon$		
Variables	**Standardized Coefficients**	**t-statistics**
Act	−0.202	−14.869 ***
Nonaudit	0.086	8.589 ***
*Act*Nonaudit*	0.214	21.401 ***
Control Variables	-	-
Adjusted R^2	0.461	
F-statistic	1297 ***	
Durbin-Watson	1.947	
Panel C Three categories of non-audit services		
$Perform = \beta_0 + \beta_1\ Act + \beta_2\ Taxes + \beta_3\ Consul + \beta_4\ Registacc + \beta_5\ Act*Taxes + \beta_6\ Act*Consul + \beta_7\ Act*Registacc + Control\ Variables + \varepsilon$		
Variables	**Standardized Coefficients**	**t-statistics**
Act	−0.185	−13.691 ***
Taxes	0.093	10.919 ***
Consul	0.147	13.713 ***
Registacc	−0.013	−1.507
*Act*Taxes*	−0.017	−1.956 *
*Act*Consul*	0.106	9.922 ***
*Act*Registacc*	0.161	18.541 ***
Control Variables	-	-
Adjusted R^2	0.472	
F-statistic	939.371 ***	
Durbin-Watson	1.950	
Panel D Six individual items of non-audit services		
$Perform = \beta_0 + \beta_1\ Act + \beta_2\ Taxplan + \beta_3\ Admrem + \beta_4\ Othertax + \beta_5\ Mangadv + \beta_6\ Corpreg + \beta_7\ Accbook + \beta_8\ Act*Taxplan + \beta_9\ Act*Admrem + \beta_{10}\ Act*Othertax + \beta_{11}\ Act*Mangadv + \beta_{12}\ Act*Corpreg + \beta_{13}\ Act*Accbook + Control\ Variables + \varepsilon$		
Variables	**Standardized Coefficients**	**t-statistics**
Act	−0.181	−13.403 ***
Taxplan	0.054	5.766 ***
Admrem	0.064	7.951 ***
Othertax	0.055	4.481 ***
Mangadv	0.123	14.596 ***
Corpreg	0.049	6.116 ***
Accbook	−0.029	−3.356 ***
*Act*Taxplan*	−0.011	−1.170
*Act*Admrem*	−0.001	−0.116
*Act*Othertax*	0.117	9.265 ***
*Act*Mangadv*	0.102	12.381 ***
*Act*Corpreg*	−0.006	−0.691
*Act*Accbook*	0.162	18.841 ***
Control Variables	-	-
Adjusted R^2	0.482	
F-statistic	669.559 ***	
Durbin-Watson	1.953	

Notes: 1. *, **, *** denote significance at the 10%, 5%, and 1% level for two-tailed test; 2. Total number of observations for the sample period is 13,642; 3. All variance inflation factors (VIFs) are less than 10 in all regression models; 4. Variables are defined in Table 1.

Panel D shows the results for the six individual items of non-audit services: tax planning (*Taxplan*), tax administrative remedy (*Admrem*), other taxes (*Othertax*); management advice (*Mangadv*), corporate registration services (*Corpreg*), and accounting and bookkeeping services (*Accbook*). This study takes a first-order differentiation over the research variable of *Act* with a value of 161,456 (161,456 = −0.181 −0.011 * 28,822 −0.001 * 24,734 + 0.117 * 430,648 + 0.102 * 249,159 − 0.006 * 221,559 + 0.162 * 539,057). This result supports H1, indicating that the operating performance of proprietorship audit firms in the post-ACT period is better than that in the pre-ACT period. Consistent with our postulation, this represents that the effect of ACT on auditors is positive.

As shown in Panel D, except for the research variable of *Accbook,* we obtain positive coefficients for *Taxplan* (t = 5.766), *Admrem* (t = 7.951), *Othertax* (t = 4.481), *Mangadv* (t = 14.596), and *Corpreg* (t = 6.116). Except for accounting and bookkeeping services, we have a positive association between five individual items of non-audit services and operating performance, so H2c is supported. Specifically, association between taxes planning, taxes administrative remedy, other taxes, management advisory, and corporate registration services and operating performance of proprietorship audit firms is positive.

The interaction term between the *Act* and other tax services (*Act * Othertax*), management advice services (*Act * Mangadv*), and accounting and bookkeeping services (*Act * Accbook*) are significantly positive (t = 9.265, 12.381 and 18.841, respectively) but insignificant for tax planning services, tax administrative remedy services, and corporate registration services. This indicates that the impact of the first three services on the operating performance of proprietorship audit firms is higher in the post-ACT period. Hence, H3c is supported for other tax services, management advice services, and accounting and bookkeeping services. The three services above present additional evidence for our postulation that the effect of ACT on auditors is positive.

In summary, we display the testing result of our hypotheses in Table 3 as follows.

Table 3. Testing results of hypotheses.

Hypotheses	Statement and Testing Results
H1	Operating performance of proprietorship audit firms in the post-ACT period is better than that in the pre-ACT period. **Results:** Supported.
H2a	Association between total non-audit services and the operating performance of proprietorship audit firms is positive **Results:** Supported.
H2b	Association between the three categories of non-audit services and the operating performance of proprietorship audit firms is positive **Results:** Supported for taxes related services, consulting services. Not supported for registration and accounting services.
H2c	Association between the six individual items of non-audit services and the operating performance of proprietorship audit firms is positive. **Results:** Supported for taxes planning services, taxes administrative remedy services, other taxes services, management advisory services, corporate registration services. Not supported for accounting and bookkeeping services.
H3a	Effect of total non-audit services on the operating performance of proprietorship audit firms is higher in the post-ACT period. **Results:** Supported.
H3b	Effect of the three categories of non-audit services on the operating performance of proprietorship audit firms is be higher in the post-ACT period. **Results:** Supported for consulting services, registration and accounting services. Not supported for taxes related services.
H3c	Impact of the six individual items of non-audit services on the operating performance of proprietorship audit firms is higher in the post-ACT period. **Results:** Supported for other taxes services, management advisory services, accounting and bookkeeping services. Not supported for tax planning services, taxes administrative remedy services, corporate registration services.

5. Discussion, Implication and Conclusions

5.1. Discussion

Based on a 28-year dataset of proprietorship audit firms in Taiwan, we obtained the following results to answer our question: What is the indirect effect of the ACT on auditors, positive or negative? Empirical results indicate that the operating performance of audit firms in the post-ACT period is significantly higher than in the pre-ACT period. The impact of non-audit services on operating performance is higher in the post-ACT period than in the pre-ACT period. Findings above support our claim that direct regulation over tax agents brings about increased competition to auditors but stimulates auditors to develop sustainable competitive advantages, which leads to indirect and positive effects on auditors. Following the passage of the ACT in 2004, Yu (2005) [1] examined the effects of the ACT on the services of audit firms in Taiwan by using a questionnaire survey, asserting that the ACT adversely affects auditors and that the severity of the adverse effects on the non-audit services is greatest for proprietorship audit firms. However, we find that the ACT positively affects non-audit services and the operating performance of proprietorship audit firms.

Prior studies of regulation in accounting investigate its direct effects on auditors, including Colbert and Murray (2003) [8], Fargher and Jiang (2008) [12], and Caplan et al. (2007) [11]. This study extends the economic theory of regulation (ETR) and presents the indirect effects of regulation on auditors. We contribute additional knowledge to the theory of regulation: regulation benefits the regulated directly and their competitors indirectly.

This study demonstrates that three levels of non-audit services are associated with the operating performance of audit firms. Based on the theory of knowledge spill-over, [27,28,38,39], our findings agree with Donohoe and Knechel (2014) [43] that non-audit services lead to subsequent improvements in operating performance. Further, this study extends prior research by providing further information on non-audit services, from single-item to three and six items of non-audit services. Deeper and more detailed information about non-audit services adds further knowledge to the literature.

5.2. Practical Implications

Our results indicate that non-audit services are positively related to operating performance and their contribution to operating performance is higher in the post-ACT period than in the pre-ACT period. Hence, auditors of proprietorship audit firms should actively take advantage of their resources and professional knowledge to provide non-audit services following the passage of the ACT. Specifically, auditors are advised to render two major categories of non-audit services, consultation services and registration and accounting services. Specifically, the individual items of non-audit services include other tax, management advice, and accounting and bookkeeping services. We suggest worldwide that professional service organizations adopt a sustainable strategy in an increased competitive operating environment, such as upgrading of service quality and expansion of business into a highly expertise-backed area.

5.3. Limitations and Direction for Future Study

This study examines the indirect effects of regulation on auditors in Taiwan. To control for market structure, this study includes the number of audit firms. Theoretically, the number of tax agents will also affect the operating performance of proprietorship audit firms. Because the Tax Agent Act is effective from 2004, the authority requires tax agents practicing before 2004 to register with the Ministry of Finance to meet the qualification of being a tax agent. The number of tax agents is available since 200, but unavailable in other years. Due to the incomplete data on tax agents, we do not include it in the regression equation, a limitation of this study. Typically, proprietorship audit firms provide different services, including traditional audit services and non-traditional services. Traditional services are long-standing services that are offered, using standardized procedures, to relatively stable clients. Non-traditional services are often referred to as non-audit services [40,61]. In the past five decades,

the traditional audit service market has become saturated and increasingly competitive, resulting in low profit margins for auditors. In contrast, non-audit services offer potentially unlimited opportunities and high profit margins for auditors. Non-audit services have played an increasingly important role in the public accounting profession. Building on the results of this study, future study is advised to examine non-audit services for the auditing industry by grouping audit firms into different segments. This study expects that the results will provide a full picture of non-audited services for auditors in their operating policy formation.

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