The current issue and full text archive of this journal is available at
www.emeraldinsight.com/0268-6902.htm

Public accounting firms' mix of service revenue and average productivity

Evidence using revenue per partner

Magdy S. Farag
Accounting Department, California State Polytechnic University, Pomona, California, USA, and
Rafik Z. Elias
Department of Accounting, California State University, Los Angeles, California, USA

Abstract

Purpose – The purpose of this study is to examine the impact of public accounting firms' mix of service revenue on their average productivity measured by total revenue per partner.

Design/methodology/approach – Using data from *Public Accounting Report* on top public accounting firms by revenue, an OLS regression model is applied by regressing revenue per partner on the percentage of revenue generated from auditing and attest, tax, management consulting, and other services independently.

Findings – Results show that the proportion of auditing and attest service revenue is negatively associated with public accounting firms' productivity. However, the proportion of other services revenue, other than tax and management consulting services, is positively associated with productivity. Additional investigation shows that if public accounting firms provide other services in their mix of services, then tax and management consulting services do not contribute to these public accounting firms' productivity.

Research limitations/implications – Results of this study cannot be generalized beyond the top 100 public accounting firms, and the measurement of revenue per partner ignores the exact number of partners within different service areas.

Practical implications – Although auditing and attest services are considered core services of public accounting firms, they do not increase the productivity of the firm.

Originality/value – This study helps in assessing whether average productivity of public accounting firms is affected by the proportion of a specific type of service in the post-SOX era.

Keywords Revenue mix, Audit fees, Productivity, CPA firms, Accounting, Auditing, Productivity rate

Paper type Research paper

Introduction

Public accounting firms provide their clients with auditing and attestation services, tax services, management consulting services (MCS) and other services. There are many factors that contribute to the existence of such a mix of services for each public accounting firm. While several studies have examined the determinants of audit fees (Simunic, 1980; Palmrose, 1986; Craswell *et al.*, 1995; Whisenant *et al.*, 2003), relatively

JEL classification – M

Managerial Auditing Journal
Vol. 27 No. 8, 2012
pp. 712-727

0268-6902
DOI 10.1108/02686901211257019

few studies have investigated the mix of service revenue of public accounting firms, especially in the post-SOX period (Banker *et al.*, 2003, 2005). In this paper, we extend the literature in this area of research by examining the impact of public accounting firms' mix of service revenue on their average productivity, as measured by total *Revenue per Partner*. This analysis helps us assess whether productivity of public accounting firms is affected by the proportion of a specific type of service. Linking revenues to the resources used to generate these revenues gives a more meaningful basis for evaluating firms' performance, which is represented in the productivity of these firms (Franz and Jerris, 2005).

Using data from the Public Accounting Report on the top 100 public accounting firms in the USA by revenue, for a sample of 505 pooled observations from 2004 to 2008, we analyze the impact of the proportion of four major types of services provided by public accounting firms on their average productivity, measured by *Revenue per Partner*. Our results indicate that the proportion of auditing and attestation service revenue is negatively associated with public accounting firms' productivity. We believe that the proportion of auditing and attest (AA) services is negatively associated with public accounting firm's productivity because these services are extremely demanding in terms of the resources needed to perform them (Banker *et al.*, 2005). Even though auditing and attestation services are considered the "bread and butter" for any public accounting firm, the resources needed to provide these services are relatively high compared to the revenue generated from them.

The proportion of other services revenue, other than tax and MCS, is positively associated with productivity. Although the proportion of revenue generated from other services is considerably lower, on average, if compared to auditing and attestation services, we believe that these other services provided by public accounting firms are significantly productive due to the low level of resources needed to provide them. Additional investigation shows that if public accounting firms provide other services in their mix of services, then tax and MCS do not contribute to these public accounting firms' productivity. Finally, the productivity of public accounting firms that do not provide any other services is positively associated with tax services and MCS.

The remainder of this paper is organized as follows. In the next section, we discuss the literature review and the development of hypotheses. In section three, we describe the research design. Section four contains the results of the model we employ. In section five, we conclude with a summary.

Literature review and development of hypotheses

Public accounting firms productivity

As profit-seeking entities, most public accounting firms provide clients with auditing and attestation, tax, management consulting and other services for a fee. Their primary objective is to maximize the bottom line profit of their firms using different types of professional services (Jerris and Pearson, 1996).

A number of studies have measured public accounting firms' productivity and efficiency. These studies have used a variety of measures, including *Total Revenue* (Banker *et al.*, 2002, 2003; GAO, 2003), *Revenue per Partner*, *Revenue per Professional*, *Revenue per Employee*, and *Revenue per Office* (Jerris and Pearson, 1996; Franz and Jerris, 2005). However, total revenue generated is not the best way to measure productivity of a public accounting firm, as it ignores the amount of resources utilized

within the firm. Therefore, linking revenues to the resources used to generate these revenues gives a more meaningful basis for evaluating firms' performance, regardless of the firm's size (Franz and Jerris, 2005).

Banker *et al.* (2003) showed that the public accounting industry improved its productivity in delivering services over time. On average, partners contributed nine times more to generating revenues than other CPA professionals in the same firms and 17-22 times more than other employees. These results suggest that the number of partners would be the best measure to proxy for public accounting firm resources compared to other CPA professionals and employees. Therefore, in this study we use *Revenue per Partner* as our measure of public accounting firm's average productivity across divisions. We assume that the number of partners within a service area in a public accounting firm is proportionate to the revenue generated from this service area to the total revenue for the firm and thus the *Revenue per Partner* variable is expected to be the same for the entire firm as well as for each service division within the same firm[1].

Auditing and attestation services

The GAO (2003) defines audit and attestation services as services provided for professional examination and verification of a company's accounting documents and supporting data for the purpose of providing an opinion on the fairness of the financial statements. Audit and attestation services are considered traditional services that public accounting firms provide to their clients (GAO, 2003). They are, considerably, the most important type of services needed from public accounting firms. However, studies have revealed that there is a continuing decline in the proportion of revenue generated by auditing and attestation services in the mix of service revenue generated by public accounting firms, which could be due to lower profitability in this type of service (Banker *et al.*, 2003, 2005).

Based on the above discussion, we expect that public accounting firms with a larger proportion of auditing and attestation services revenue will be lower in productivity as measured by *Revenue per Partner*. Therefore, our first hypothesis is:

H1. There is a negative association between public accounting firms' average productivity and their proportion of auditing and attestation service revenue earned.

Tax services

Tax services are another traditional type of services provided by public accounting firms. They include tax preparation, tax shelters and tax consulting services. This type of service is considered the second most important source of revenue for public accounting firms (Omer *et al.*, 2006). Tax services were initially among the non-audit services prohibited in SOX. However, because tax services can provide benefits to the taxpayer, the final rules of SOX allowed public accounting firms to provide tax services to their audit clients (Omer *et al.*, 2006).

Franz and Jerris (2005) showed that top public accounting firms have experienced a significant increase in the percentage of their revenue from tax services over the period from 1995 to 2004. However, smaller public accounting firms have experienced a consistent trend in the percentage of their revenue from tax services over the same time period. Zeff (2003) emphasized that the distribution of the public accounting firms' gross fees shifted markedly from auditing to tax and consulting services.

Consequently, we expect that public accounting firms with larger proportion of tax service revenue will be more productive. Therefore, our second hypothesis is:

H2. There is a positive association between public accounting firms' average productivity and their proportion of tax service revenue earned.

Management consulting services

In the last decade of the past millennium, competition and technological changes had a significant impact on the survival and growth of public accounting firms' clients, which in turn led to a substantial growth in the demand for MCS[2] (Banker *et al.*, 2005). Rankin and Sharp (2000) confirmed the widespread view that public accounting firms have seen rapid growth in the proportion they derive from MCS. Partners of public accounting firms believe that the main reasons leading to this rapid growth have been the increasing market demand for consulting services, the higher profit margins for consulting services and the audit services relationship that facilitates consulting engagements. However, dramatic transformations characterized the public accounting industry in the beginning of the new millennium, where SOX prohibited public accounting firms from auditing publicly held clients to whom they are simultaneously providing other non-audit services, including consulting services. However, it did not restrict non-audit services for audits of privately-held clients, which encouraged public accounting firms to keep providing these high profit margin services (Houston *et al.*, 2005). Based on this, our third hypothesis is:

H3. There is a positive association between public accounting firms' average productivity and their proportion of management consulting service revenue earned.

Other services

Other services provided by public accounting firms include bookkeeping or other services related to the accounting records or financial statements of the audit client; financial information systems design and implementation; appraisal or valuation services; actuarial services; internal audit outsourcing services; management functions or human resources; broker or dealer, investment adviser, or investment banking services; and legal services and expert services unrelated to the audit. These other services were among the non-audit services prohibited by SOX. However, due to the high profit margins generated from these other services, public accounting firms continued to provide them to their private clients and non-audit public clients (Houston *et al.*, 2005). This leads to our fourth hypothesis:

H4. There is a positive association between public accounting firms' average productivity and their proportion of other services revenue earned.

Research design

Sample

The data used in this study were obtained from the Public Accounting Report published by CCH/Wolters-Kluwer Publications (Public Accounting Report, 2004-2008). Our sample includes 505 pooled observations from 2004 to 2008 for which total revenue for each public accounting firm was available. Since SOX requirements were effective in 2002, we used 2004 as the first year in order to allow CPA firms enough time to fully meet

these requirements. On average, we have 101 observations per fiscal year. Revenue proportions are split into percentages of AA tax, management consulting, and other services[3].

Methodology

To assess the impact of the mix of service revenue on the total revenue of public accounting firms, we examine the association between total revenue and the percentage of revenue generated from auditing and attestation, tax, management consulting and other services independently. We control for factors that are expected to impact total revenue like growth, number of CPA professionals in the public accounting firm, number of offices, number of SEC clients, and whether the public accounting firm is a Big 4 or a second tier firm. We scale the regression by dividing all continuous variables by the number of partners in the public accounting firm[4]. We use the following OLS regression model to test our hypotheses:

$$\begin{aligned}\text{Revenue per Partner}_{it} = {} & \alpha_0 + \alpha_1 \text{Proportion}_{it} + \alpha_2 \text{Growth}_{it} \\ & + \alpha_3 \text{Professionals per Partner}_{it} \\ & + \alpha_4 \text{Offices to Partners}_{it} + \alpha_5 \text{SEC Clients per Partner}_{it} \\ & + \alpha_6 \text{Big 4}_{it} + \alpha_7 \text{Second tier}_{it} + \alpha_8 \text{Year 2004}_{it} \\ & + \alpha_9 \text{Year 2005}_{it} + \alpha_{10} \text{Year 2006}_{it} + \alpha_{11} \text{Year 2007}_{it} + \varepsilon_{it}\end{aligned} \quad (1)$$

The variables are defined as follows:

- *Revenue per Partner*. Total revenue for public accounting firm (i) in fiscal year (t), expressed in million dollars, divided by the number of partners in public accounting firm (i) in fiscal year (t). Linking revenues to the resources used to generate them, such as Revenue per Partner, gives a more meaningful basis for measurement and evaluation (Jerris and Pearson, 1996). Partners contribute more to generating revenues than professionals and other employees in a public accounting firms (Banker *et al.*, 2003, 2005), which makes *Revenue per Partner* a better measure for productivity. Following Franz and Jerris (2005), we use *Revenue per Partner* to proxy for productivity in a public accounting firm. We use *Revenue per Partner* for the entire public accounting firm as an average value across the divisions within the firm. We assume that the number of partners within a service division is proportionate to the revenue generated from this service area. Therefore, the *Revenue per Partner* variable is expected to be the same for the entire firm, on average, as well as for each service division within the same firm.
- *Proportion*. Percentage of AA, tax (TAX), MCS, or other (OTHER) services revenue earned by a public accounting firm (i) in a fiscal year (t). Each of these percentages is included in the regression model separately. Since *H1* argues that public accounting firms' productivity is negatively associated with the proportion of revenue provided by AA services, we expect the coefficient for AA to be negative.
  As *H2-H4* argue that public accounting firms' productivity is positively associated with the proportion of revenue provided by tax, management consulting, and other services revenue, respectively, the coefficients for TAX, MCS, and OTHER are expected to be positive.

- *Growth.* Percentage of change in total revenue for public accounting firm (i) in a fiscal year (t) compared to the previous year ($t - 1$), calculated as:

$$\frac{[Total\,Revenue\,(t) - Total\,Revenue(t-1)]}{Total\,Revenue\,(t-1)}$$

  Growth introduces pressure on partners to achieve revenue targets. This pressure is further magnified because partners' compensation often is based in large part on achieving revenue targets or other financial goals (Zeff, 2003). Therefore, we would expect a positive association between *Growth* and *Revenue per Partner*.
- *Professionals per Partner.* Number of professionals in a public accounting firm (i) in a fiscal year (t) divided by the number of partners in a public accounting firm (i) in a fiscal year (t). The number of CPA professionals in a public accounting firm measures the ability of the firm to effectively generate revenue by providing client services (Franz and Jerris, 2005). Public accounting firms generate revenues by billing for the hours their professionals work for clients. Thus, we expect a positive coefficient for *Professionals per Partner*.
- *Offices to Partners.* Number of branch offices in a public accounting firm (i) in a fiscal year (t) divided by the number of partners in a public accounting firm (i) in a fiscal year (t). The larger the number of branch offices for a public accounting firm, the more the ability to meet clients' needs geographically (Jerris and Pearson, 1996). However, the larger the number of partners in each branch office, the more the ability of a public accounting firm to generate *Revenue per Partner*. Therefore, we expect public accounting firms with a higher ratio of *Offices to Partners* to have lower amount of *Revenue per Partner*.
- *SEC Clients per Partner.* This is the number of SEC registered clients served by public accounting firm (i) in a fiscal year (t) divided by the number of partners in a public accounting firm (i) in a fiscal year (t). Several requirements of SOX have increased the audit workload for publicly held companies (SEC clients), which led to higher audit fees charged to these companies (Ghosh and Pawlewicz, 2009). Therefore, we expect that the larger the number of SEC clients that are served on average by each partner in a public accounting firm, the higher the amount of *Revenue per Partner* will be[5]. Thus, a positive coefficient for *SEC Clients per Partner* is expected.
- *Big 4.* A dummy variable that equals one if the public accounting firm (i) is one of the Big 4 public accounting firms in fiscal year (t), and 0 otherwise. Prior studies document that large public accounting firms (Big 4) charge their clients a fee premium (Craswell *et al.*, 1995; Choi *et al.*, 2008). As legal liability costs are higher for large public accounting firms, they have greater incentives to increase audit effort compared to small public accounting firms (Choi *et al.*, 2008). Therefore, we expect a positive association between Big 4 and *Revenue per Partner*.
- *Second tier.* A dummy variable that equals one if the public accounting firm (i) is one of the second tier public accounting firms in year (t), and 0 otherwise. Hogan and Martin (2009) showed that second tier public accounting firms are increasingly exposed to more business risk as they accept larger clients coming from Big 4

predecessor auditors, which may increase their exposure to litigation and the amount of fee premium charged to their clients. Thus, we expect a positive coefficient for *second tier*.

We finally control for year differences by including four year dummy variables.

Empirical results

Descriptive statistics

Table I presents summary statistics for the variables used in the study. The mean values of *AA, TAX, MCS,* and *OTHER* are 44.00, 31.41, 15.26, and 9.38 percent, respectively, which indicates that the revenue generated from auditing and attestation services represents, on average, the highest proportion of revenue for public accounting firms. The revenue generated from tax services is more than the revenues generated from MCS and other services combined. Table I also shows that the mean values of *Revenue* and *Revenue per Partner* for the 505 observations used in the sample over the five-year period of the study are 329.79 million US dollars and 1.69 million US dollars, respectively. The mean value for the number of *Partners* in each public

Variable	Mean	SD	Median	Minimum	Maximum
Revenue	329.79	1,250.00	13	16.5	9,848
Revenue per Partner	1.69	0.73	1.51	0.5	5.1
Growth	15.37	11.80	39	−9.6	109
Partners	136.26	416.97	27	7	2,758
Professionals	1,095.00	3,711.00	184	30	29,725
Offices	12.12	20.95	5	1	125
SEC Clients	96.98	402.92	6	0	3,597
Big 4	0.04	0.20	0	0	1
Second tier	0.04	0.20	0	0	1
AA	44.00	9.89	45	9	78
TAX	31.41	12.53	31	0	80
MCS	15.26	11.84	14	0	62
OTHER	9.38	0.20	6	0	64

Notes: $n = 505$; the data are for the Public Accounting Report (2004-2008); all variables are defined as follows: Revenue – total revenue for public accounting firm (i) in fiscal year (t), expressed in million dollars; Revenue per Partner – total revenue for public accounting firm (i) in fiscal year (t), expressed in million dollars, divided by the number of partners in public accounting firm (i) in fiscal year (t); Growth – percentage of change in total revenue for public accounting firm (i) in fiscal year (t) compared to the previous year (t − 1); Partners – number of partners in public accounting firm (i) in fiscal year (t); Professionals – number of professionals in public accounting firm (i) in fiscal year (t); Offices – number of branch offices in public accounting firm (i) in fiscal year (t); SEC Clients – number of Security and Exchange Commission (SEC) registered clients served by public accounting firm (i) in fiscal year (t); Big 4 – a dummy variable that equals one if the public accounting firm (i) is one of the Big 4public accounting firms in fiscal year (t), and 0 otherwise; second tier – a dummy variable that equals one if the public accounting firm (i) is one of the Second–tier public accounting firms in year (t), and 0 otherwise; AA – proportion of AA service revenue earned by public accounting firm (i) in fiscal year (t); TAX – proportion of tax service revenue earned by public accounting firm (i) in fiscal year (t); MCS – proportion of management consulting service revenue earned by public accounting firm (i) in fiscal year (t); OTHER – proportion of other revenue earned by public accounting firm (i) in fiscal year (t)

Table I.
Sample descriptive statistics

accounting firm is 136.26 partners and for the number of *Professionals* in each public accounting firm is 1,095 professionals. On average, each public accounting firm has 12.12 branch *Offices* and 96.98 *SEC Clients*.

The Spearman correlation matrix in Table II shows that the variables, in general, are not highly correlated with each other, with the exceptions of *Revenue per Partner* and *Professionals per Partner* ($\rho = 0.7915$). Correlation results also show that *Revenue per Partner* is negatively correlated with *AA* and *TAX*, but positively correlated with *OTHER*.

Regression results regarding the mix of service revenue

In this section, we discuss results of the regression of *Revenue per Partner* on the four test variables: auditing and attestation, tax service, MCS and other services. In Table III, we report the results of our regressions using each of the four test variables. All regressions are statistically significant with adjusted R^2s ranging from 0.762 to 0.783[6].

Column 1 in Table III presents the results of the regression model (1) without including any of the test variables. The empirical results show that the coefficients on all independent variables are statistically significant and in the expected direction. All independent variables have positive coefficients except for *Offices to Partners*, where its coefficient is negatively associated with *Revenue per Partner*.

As discussed earlier, finding a negative coefficient on AA would support *H1* that public accounting firms' average productivity is negatively associated with the proportion of AA services revenue earned. Empirical results in Column 2 of Table III show that the coefficient on AA is statistically significant and negative.

With respect to *H2*, Column 3 of Table III shows that the coefficient on TAX has, as expected, a positive sign that is significant at the 10 percent level of statistical testing. This finding generally supports the *H2* that public accounting firms with larger proportion of tax services revenue are higher in productivity, as measured by *Revenue per Partner*.

Results failed to support *H3*. Although the coefficient on MCS is positive, it is not statistically significant. Therefore, based on our sample, we cannot conclude that public accounting firms with a larger proportion of MCS revenue are higher in productivity.

The coefficient on OTHER supports *H4*. Column 5 of Table III shows that the coefficient on OTHER is statistically significant and positive, which supports our conjecture that public accounting firms with larger proportion of other services revenue are higher in productivity. These findings support *H1*, *H2*, and *H4*, but fail to support *H3*.

Additional analysis

The increase in the provision of non-audit services contributed to growing concern about auditor independence. Although auditor independence standards have always required that the accounting firm be independent both in fact and in appearance, concern over auditor independence continued to be an issue for accounting firms (GAO, 2003). Currently, SOX prohibits public accounting firms from providing non-audit services for their publicly held audit clients. Although most accounting firms continue to offer certain non-audit services, some firms opted to sell or divest portions of their non-audit services[7] (GAO, 2003). Therefore, we test our hypotheses separately for public accounting firms that reported revenue generated from other services and for public accounting firms that did not report any revenue from other services. Table IV presents the results of model (1) using 344 observations, where public accounting firms

Table II.
Spearman correlation coefficients for sample variables

	Revenue per Partner	Growth	Professionals per Partner	Offices to Partner	SEC Clients per Partner	Big 4	Second tier	AA	TAX	MCS
Growth	0.2636*									
	(0.001)									
Professionals per partner	0.7915*	0.2113*								
	(0.001)	*(0.001)*								
Offices to Partners	−0.0312	−0.0059	0.1732*							
	(0.484)	*(0.895)*	*(0.001)*							
SEC Clients per partner	0.1581*	0.0660	0.0748*	−0.1499*						
	(0.001)	*(0.139)*	*(0.093)*	*(0.001)*						
Big 4	0.2921*	−0.0902*	0.1567*	−0.3033*	0.2321*					
	(0.001)	*(0.043)*	*(0.001)*	*(0.001)*	*(0.001)*					
Second tier	0.1677*	0.0163	0.0963*	−0.0084*	0.2047*	−0.0412				
	(0.001)	*(0.715)*	*(0.001)*	*(0.851)*	*(0.001)*	(0.355)				
AA	−0.1056*	0.0308	−0.1290*	−0.2715*	0.4335*	0.2131*	0.0973*			
	(0.018)	0.490	*(0.004)*	*(0.001)*	*(0.001)*	*(0.001)*	*(0.029)*			
TAX	−0.1113*	−0.0499	−0.1249*	−0.0647	−0.0936*	−0.1113*	−0.1075*	−0.2721*		
	(0.012)	0.268	*(0.005)*	*(0.146)*	(0.035)	(0.012)	(0.016)	*(0.001)*		
MCS	−0.0709	−0.0781	0.0378	0.1190*	−0.2505*	−0.1582*	0.0929*	−0.4046*	−0.2080*	
	(0.111)	0.079	*(0.397)*	*(0.007)*	*(0.001)*	*(0.001)*	(0.037)	*(0.001)*	*(0.001)*	
OTHER	0.1027*	0.0575	0.1041*	0.1711*	−0.0450	−0.0686	−0.1161*	−0.3620*	−0.1095*	−0.3357*
	(0.021)	*(0.196)*	*(0.019)*	*(0.001)*	*(0.312)*	*(0.123)*	*(0.009)*	*(0.001)*	*(0.014)*	*(0.001)*

Notes: $n = 505$; significant at: $p < 0.10$; p-values are shown below correlation coefficients in parentheses; variables are defined as follows: Professionals per Partner – number of professionals in public accounting firm (i) in fiscal year (t) divided by the number of partners in public accounting firm (i) in fiscal year (t); Offices to Partners – number of branch offices in public accounting firm (i) in fiscal year (t) divided by the number of partners in public accounting firm (i) in fiscal year (t); SEC Clients per Partner – number of SEC registered clients served by public accounting firm (i) in fiscal year (t) divided by the number of partners in public accounting firm (i) in fiscal year (t); other variables definitions appear in Table I

Table III.
OLS regression results for full sample

$$Revenue\ per\ Partner_{it} = \alpha_0 + \alpha_1 Proportion_{it} + \alpha_2 Growth_{it} + \alpha_3 Professionals\ per\ Partner_{it} + \alpha_4 Offices\ to\ Partners_{it} + \alpha_5 SEC\ Clients\ per\ Partner_{it} + \alpha_6 Big\ 4_{it} + \alpha_7 Second\ Tier_{it} + \alpha_8 Year2004_{it} + \alpha_9 Year2005_{it} + \alpha_{10} Year2006_{it} + \alpha_{11} Year2007_{it} + \varepsilon_{it}$$

	Column 1		Column 2		Column 3		Column 4		Column 5	
Independent variables	Coeff.	*t*-stat.	Coeff.	*t*-stat.	Coeff.	*t*-stat.	Coeff.	*t*-stat.	Coeff.	*t*-stat.
Intercept	0.542^{***}	10.12	0.984^{***}	12.13	0.441^{***}	5.74	0.525^{***}	9.44	0.512^{***}	9.65
AA			-0.009^{***}	−7.02						
TAX					0.003^{*}	1.83				
MCS							0.001	1.10		
OTHER									0.006^{***}	4.36
Growth	0.005^{***}	3.14	0.005^{***}	3.34	0.005^{***}	3.19	0.005^{***}	3.16	0.004^{***}	3.07
Professionals per Partner	0.157^{***}	31.31	0.153^{***}	31.77	0.157^{***}	31.43	0.156^{***}	31.13	0.155^{***}	31.46
Offices to partners	-0.382^{***}	−3.25	-0.578^{***}	−4.99	-0.384^{***}	−3.26	-0.395^{***}	−3.34	-0.455^{***}	−3.89
SEC Clients per Partner	0.088^{***}	4.66	0.131^{***}	6.89	0.091^{***}	4.80	0.093^{***}	4.79	0.093^{***}	5.00
Big 4	1.021^{***}	11.96	1.135^{***}	13.66	1.033^{***}	12.10	1.028^{***}	12.01	1.042^{***}	12.41
Second tier	0.419^{***}	5.09	0.469^{***}	5.94	0.434^{***}	5.26	0.412^{***}	5.00	0.451^{***}	5.55
Year 2004	-0.264^{***}	−5.12	-0.286^{***}	−5.81	-0.263^{***}	−5.12	-0.268^{***}	−5.19	-0.261^{***}	−5.16
Year 2005	-0.189^{***}	−3.73	-0.218^{***}	−4.49	-0.188^{***}	−3.70	-0.195^{***}	−3.82	-0.190^{***}	−3.81
Year 2006	−0.060	−1.19	−0.068	−1.42	−0.058	−1.15	−0.062	−1.23	−0.061	−1.23
Year 2007	-0.109^{**}	−2.18	-0.117^{**}	−2.44	-0.106^{**}	−2.12	-0.110^{**}	−2.19	-0.117^{**}	−2.37
	F-stat. = 162.35		*F*-stat. = 166.51		*F*-stat. = 148.59		*F*-stat. = 147.76		*F*-stat. = 154.71	
	$p < 0.001$		$p < 0.001$		$p < 0.001$		$p < 0.001$		$p < 0.001$	
	Adj. $R^2 = 0.762$		Adj. $R^2 = 0.783$		Adj. $R^2 = 0.763$		Adj. $R^2 = 0.762$		Adj. $R^2 = 0.770$	

Notes: Significant at: $^{*}p < 0.10$, $^{**}p < 0.05$ and $^{***}p < 0.01$ percent levels; $n = 505$; the dependent variable is (Revenue per Partner) calculated as total revenue for public accounting firm (i) in fiscal year (t); expressed in million dollars, divided by the number of partners in public accounting firm (i) in fiscal year (t); variables definitions appear in Tables I and II; Year t – a dummy variable that equals one if the year (t) of the data observation for the public accounting firm (i) is t = T, and 0 otherwise, where T = 2004, 2005, 2006, and 2007

Table IV.
OLS regression results for sub-sample A

$$Revenue\ per\ Partner_{it} = \alpha_0 + \alpha_1 Proportion_{it} + \alpha_2 Growth_{it} + \alpha_3 Professionals\ per\ Partner_{it} + \alpha_4 Offices\ to\ Partners_{it} + \alpha_5 SEC\ Clients\ per\ Partner_{it} + \alpha_6 Big\ 4_{it} + \alpha_7 Second\ Tier_{it} + \alpha_8 Year2004_{it} + \alpha_9 Year2005_{it} + \alpha_{10} Year2006_{it} + \alpha_{11} Year2007_{it} + \varepsilon_{it}$$

Independent variables	Column 1		Column 2		Column 3		Column 4		Column 5	
	Coeff.	*t*-stat.	Coeff.	*t*-stat.	Coeff.	*t*-stat.	Coeff.	*t*-stat.	Coeff.	*t*-stat.
Intercept	0.589***	8.64	1.018***	9.95	0.499***	5.00	0.607***	8.51	0.517***	7.67
AA			−0.009***	−5.45						
TAX					0.003	1.24				
MCS							−0.002	−0.86		
OTHER									0.009***	5.09
Growth	0.005**	2.50	0.005***	2.67	0.005**	2.52	0.005**	2.48	0.004**	2.50
Professionals per Partner	0.151***	24.46	0.149***	25.11	0.151***	24.51	0.151***	24.45	0.148***	24.73
Offices to Partners	−0.381**	−5.50	−0.577***	−3.83	−0.379**	−2.49	−0.365**	−2.38	−0.486***	−3.27
SEC Clients per Partner	0.112***	4.98	0.159***	6.86	0.115***	5.11	0.108***	4.76	0.127***	5.82
Big 4	1.074***	10.24	1.165***	11.41	1.084***	10.31	1.074***	10.23	1.129***	11.10
Second tier	0.410***	3.22	0.398***	3.26	0.421***	3.30	0.429***	3.32	0.455***	3.69
Year 2004	−0.292***	−4.45	−0.318***	−5.04	−0.288***	−4.39	−0.287***	−4.36	−0.305***	−4.81
Year 2005	−0.216***	−3.32	−0.251***	−4.00	−0.213***	−3.26	−0.212***	−3.23	−0.238***	−3.78
Year 2006	−0.070	−1.10	−0.076	−1.25	−0.067	−1.05	−0.069	−1.09	−0.081	−1.33
Year 2007	−0.108*	−1.74	−0.111*	−1.86	−0.105*	−1.69	−0.109*	−1.74	−0.123**	−2.04
	F-stat. = 101.07		*F*-stat. = 102.49		*F*-stat. = 92.17		*F*-stat. = 91.88		*F*-stat. = 101.09	
	$p < 0.001$		$p < 0.001$		$p < 0.001$		$p < 0.001$		$p < 0.001$	
	Adj. $R^2 = 0.745$		Adj. $R^2 = 0.765$		Adj. $R^2 = 0.745$		Adj. $R^2 = 0.745$		Adj. $R^2 = 0.763$	

Notes: $n = 344$; significant at: *$p < 0.10$, **$p < 0.05$ and ***$p < 0.01$ percent levels; the dependent variable is (Revenue per Partner) calculated as total revenue for public accounting firm (i) in fiscal year (t), expressed in million dollars, divided by the number of partners in public accounting firm (i) in fiscal year (t); variables definitions appear in Tables I-III

have a proportion of other services that is greater than zero (sub-sample A). The coefficients of AA and OTHER presented in Column 2 and Column 5 of Table IV supports our previous findings using the pooled data that public accounting firms' productivity is negatively associated with the proportion of AA services revenue earned, while positively associated with the proportion of other services revenue earned. The coefficients of TAX and MCS presented in Column 3 and Column 4 of Table IV do not support *H2* and *H3*. These findings suggest that tax services and MCS provided by public accounting firms do not contribute to the productivity of these firms if they provide other services in their mix of services.

In addition, Table V presents the results of model (1) using 161 observations of public accounting firms that have a proportion of other services that is equal to zero (sub-sample B). Consistent with results in Tables III and IV, Column 2 of Table V shows that the coefficient on AA is statistically significant and negative at the 1 percent level of statistical testing. However, contrary to results in Table IV, Column 3 and Column 4 of Table V show that the coefficients of TAX and MCS are statistically significant, suggesting that public accounting firms that do not generate revenue from other services rely on tax services and MCS in their productivity[8].

Conclusion

In this study, we examine the impact of the mix of service revenue of public accounting firms on their average productivity measured by *Revenue per Partner*. *Revenue per Partner* is a good proxy for productivity, as it links revenues to the resources used to generate these revenues, which gives a more meaningful basis for evaluating firms' performance regardless of the firm's size.

The findings of this study show that public accounting firms' productivity is negatively associated with the reported proportion of auditing and attestation services revenue. Our results suggest that although auditing and attestation services are considered core services of public accounting firms, they do not increase the productivity of the firm, as measured by *Revenue per Partner*. On the contrary, they have a negative impact on the firms' productivity. Public accounting firms should balance between the different types of services they provide. Focusing only on auditing and attestation services could have a negative impact on the firms' productivity. Therefore, public accounting firms should assess themselves and determine the need for structural changes in the delivery of their professional services.

Another important finding of this study is the positive relationship between both tax and other services provided by public accounting firms and productivity. One of the few studies that previously investigated this issue is Banker *et al.* (2005), which presented evidence that public accounting firms that were early movers into MCS and those that emphasized growth in these type of services over growth in the traditional audit and tax services, enjoyed significantly higher productivity than their peers toward the end of the twentieth century. Contrary to their results, we find that there is a significant positive association between the proportion of revenue generated from tax services and productivity, especially for public accounting firms that do not provide other services. One possible reason for the different finding is that, in the post-SOX period, public accounting firms have tried to avoid reliance on MCS in generating revenue, but have relied more on traditional services or other services as long as they do not violate SOX regulations.

Table V.
OLS regression results for sub-sample B

$$Revenue\ per\ Partner_{it} = \alpha_0 + \alpha_1 Proportion_{it} + \alpha 2 Growth_{it} + \alpha_3 Professionals\ per\ Partner_{it} + \alpha_4 Offices\ to\ Partners_{it} + \alpha_5 SEC\ Clients\ per\ Partner_{it} + \alpha_6 Big\ 4_{it} + \alpha_7 Second\ Tier_{it} + \alpha_8 Year2004_{it} + \alpha_9 Year2005_{it} + \alpha_{10} Year2006_{it} + \alpha_{11} Year2007_{it} + \varepsilon_{it}$$

Independent variables	Column 1		Column 2		Column 3		Column 4	
	Coeff.	*t*-stat.	Coeff.	*t*-stat.	Coeff.	*t*-stat.	Coeff.	*t*-stat.
Intercept	0.380***	4.55	0.862***	6.35	0.211*	1.81	0.331***	3.93
AA			−0.008***	−4.36				
TAX					0.005**	2.04		
MCS							0.005**	2.51
Growth	0.005**	2.31	0.006**	2.58	0.006**	2.47	0.005**	2.28
Professionals per Partner	0.179***	20.97	0.170***	20.39	0.180***	21.29	0.172***	19.46
Offices to Partners	−0.503***	−2.80	−0.666***	−3.82	−0.519***	−2.91	−0.586***	−3.26
SEC Clients per Partner	−0.040	−1.03	0.004	0.12	−0.047	−1.23	0.006	−0.14
Big 4	0.902***	6.28	1.096***	7.68	0.931***	6.52	0.990***	6.81
Second tier	0.503***	5.01	0.587***	6.07	0.535***	5.33	0.520***	5.26
Year 2004	−0.172**	−2.15	−0.199***	−2.62	−0.183**	−2.31	−0.177***	−2.25
Year 2005	−0.112	−1.44	−0.144*	−1.95	−0.118	−1.54	−0.124	−1.63
Year 2006	−0.042	−0.53	−0.060	−0.79	−0.047	−0.59	−0.049	−0.62
Year 2007	−0.110	−1.35	−0.132*	−1.71	−0.109	−1.35	−0.123	−1.54
	F-stat. = 70.24		*F*-stat. = 73.26		*F*-stat. = 65.59		*F*-stat. = 66.69	
	$p < 0.001$		$p < 0.001$		$p < 0.001$		$p < 0.001$	
	Adj. $R^2 = 0.812$		Adj. $R^2 = 0.832$		Adj. $R^2 = 0.816$		Adj. $R^2 = 0.819$	

Notes: $n = 161$; significant at: *$p < 0.10$, **$p < 0.05$ and ***$p < 0.01$ percent levels; the dependent variable is (Revenue per Partner) calculated as total revenue for public accounting firm (i) in fiscal year (t), expressed in million dollars, divided by the number of partners in public accounting firm (i) in fiscal year (t); variables definitions appear in Tables I-III

Finally, the results of our study show that public accounting firms that do not generate revenue from any other services rely mainly on tax services and management and consulting services to enhance their productivity.

Overall, the findings of this study increase our understanding about public accounting firms' productivity. However, results of this study are subject to some limitations. First, these results cannot be generalized beyond the top 100 public accounting firms. Large public accounting firms are basically different from small public accounting firms, where small firms have inherently a smaller proportion of AA services and a larger proportion of tax services.

Second, due to data limitations, we were unable to determine the costs for each service area provided by the public accounting firms in the study, or the spread of the costs among these services. Also, in this study, the measurement of *Revenue per Partner* is based on the total number of partners in a public accounting firm, which ignores the exact number of partners within different service areas. Future research can examine how many partners work within each service area to determine a more precise *Revenue per Partner* productivity measure for each service division within a public accounting firm, instead of relying on average productivity.

Notes

1. We calculate *Revenue per Partner* for each public firm as an average value for the entire firm across all service areas because publicly available data about the number of partners is only available on the firm level and not by service area. However, it is possible that the revenue generated per partner in one service area be different from the *Revenue per Partner* in another service area, and this is a limitation of our study.
2. Some studies refer to MCS as Management Advisory Services, for example Jerris and Pearson (1996) and Banker *et al.* (2005).
3. In few observations, percentages did not add up to 100 because of rounding or the exclusion of certain practice areas.
4. A scaling factor is used to reduce heteroscedasticity, for example, Lipe (1986) deflated earnings components by the Consumer Price Index.
5. Since the total number of clients served by each public accounting firms is not available in the data set we utilize, we cannot identify the proportion of SEC clients to total clients served by each public accounting firm.
6. We ran diagnostic tests for the presence of multicollinearity in the models. The variance inflation factors (VIF) results indicate that multicollinearity is not a serious concern.
7. Some public accounting firms elect to minimize MCS and other services other than AA, and tax services, for example Ernst and Young.
8. The independent variable OTHER is removed from the model because all public accounting firms in sub-sample B do not generate revenue from other services.

References

Banker, R., Chang, H. and Cunningham, R. (2003), "The public accounting industry production function", *Journal of Accounting and Economics*, Vol. 35 No. 2, pp. 225-81.

Banker, R., Chang, H. and Kao, Y. (2002), "Impact of information technology on public accounting firms productivity", *Journal of Information Systems*, Vol. 16 No. 2, pp. 209-22.

Banker, R., Chang, H. and Natarajan, R. (2005), "Productivity change, technical progress, and relative efficiency change in the public accounting industry", *Management Science*, Vol. 51 No. 2, pp. 291-304.

Choi, J.-H., Kim, J.-B., Qiu, A. and Simunic, D. (2008), "Audit pricing, legal liability regimes, and Big 4 premiums: theory and cross country evidence", *Contemporary Accounting Research*, Vol. 25 No. 1, pp. 55-99.

Craswell, A., Francis, J. and Taylor, S. (1995), "Auditor brand name reputations and industry specializations", *Journal of Accounting and Economics*, Vol. 20, December, pp. 297-322.

Franz, D. and Jerris, S. (2005), "Benchmarking CPA firms for productivity and efficiency: a decade comparison 1994 versus 2004", *Journal of Business & Economic Research*, Vol. 3 No. 8, pp. 35-42.

Ghosh, A. and Pawlewicz, R. (2009), "The impact of regulation on auditor fees: evidence from the Sarbanes-Oxley Act", *Auditing: A Journal of Practice and Theory*, Vol. 28 No. 2, pp. 171-97.

Hogan, C.E. and Martin, R.D. (2009), "Risk shifts in the market for audits: an examination of changes in risk for second tier audit firms", *Auditing: A Journal of Practice and Theory*, Vol. 28 No. 2, pp. 93-118.

Houston, R.W., Peters, M.F. and Pratt, J.H. (2005), "Non-litigation risk and pricing audit services", *Auditing: A Journal of Practice and Theory*, Vol. 24 No. 1, pp. 37-53.

Jerris, S.I. and Pearson, T.A. (1996), "Benchmarking CPA firms for productivity and efficiency", *The CPA Journal*, Vol. 66 No. 7, pp. 64-6.

Lipe, R.C. (1986), "The information contained in the components of earnings", *Journal of Accounting Research*, Vol. 24, pp. 37-64, supplement.

Omer, T., Bedard, J. and Falsetta, D. (2006), "Auditor-provided tax services: the effects of a changing regulatory environment", *The Accounting Review*, Vol. 81 No. 5, pp. 1095-117.

Palmrose, Z. (1986), "Audit fees and auditor size: further evidence", *Journal of Accounting Research*, Vol. 24 No. 1, pp. 97-110.

Public Accounting Report (2004-2008), Public Accounting Report's Top 100 Firms, CCH/Wolters-Kluwer, Amsterdam.

Rankin, L.J. and Sharp, F.C. (2000), "The new mix of client services", *The CPA Journal*, Vol. 70 No. 5, pp. 38-45.

Simunic, D. (1980), "The pricing of audit services: theory and evidence", *Journal of Accounting Research*, Vol. 18 No. 1, pp. 161-90.

Whisenant, S., Sankaraguruswamy, S. and Raghunandan, K. (2003), "Evidence in the joint determination of audit and non-audit fees", *Journal of Accounting Research*, Vol. 41, September, pp. 721-44.

Zeff, S. (2003), "How the US accounting profession got where it is today: part II", *Accounting Horizons*, Vol. 17 No. 4, pp. 267-86.

Further reading

Bryan-Low, C. (2003), "Accounting firms still earn more from consulting fees", *Wall Street Journal*, April 16.

US Congress (2002), *Sarbanes-Oxley Act of 2002*, 107 H.R. 3763.

About the authors

Magdy S. Farag is an Assistant Professor of Accounting at California State Polytechnic University, Pomona. He received his PhD in Accounting from Kent State University. His research has been published *in Accounting Research Journal*; *Managerial Auditing Journal*; *Journal of the Academy of Business Education*; *International Journal of Business, Accounting, and Finance*; and the *International Journal of Global Management Studies*. His research interests are in the areas of auditing, financial accounting, and ethics. Magdy S. Farag is the corresponding author and can be contacted at: mfarag@csupomona.edu

Rafik Z. Elias is a Professor of Accounting at California State University, Los Angeles. He received his DBA in Accounting from Louisiana Tech University and he is a Certified Public Accountant (CPA). His research has been published in *Advances in Accounting, Journal of Business Ethics, Managerial Auditing Journal, Accounting Research Journal* and *Advances in Public Interest Accounting*. His research interests are in the areas of auditing, accounting education, and ethics.