

*Dejan Jakšić**
*Kristina Mijić***
*Mirko Andrić****

ANALYSIS OF VARIATIONS IN THE PERFORMANCE OF AUDIT FIRMS IN THE REPUBLIC OF SERBIA

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ABSTRACT: *The paper presents an analysis of the performance of audit firms in the Republic of Serbia in the period 2008-2010. For this period the trend in the number of audit firms in the Republic of Serbia, the size and number of employees in audit firms, and the participation of individual audit firms in total operating revenue, employment, and net income were observed. Further, correlation analysis of variations in operating revenue, employment, and net income of audit firms was carried out. The analysis showed the absence of the expected*

correlation between operating revenue and net income, as well as between the number of employees and net income. Additional analysis showed that the newly established audit firms achieved lower than average results and a higher level of variation in the level of profitability in relation to the audit firms that have been in the audit service market longer.

KEY WORDS: *audit firm, analysis, operating revenue, net income, employment, profitability*

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* Faculty of Economics Subotica, jaksicd@ef.uns.ac.rs

** Faculty of Economics Subotica, mijick@ef.uns.ac.rs

*** Faculty of Economics Subotica, andric@ef.uns.ac.rs

1. INTRODUCTION

The main objective of the financial statement audit is to increase confidence in financial statements through an unbiased and competent expression of opinion on their fair presentation. The financial statement is an important source of information in the business decision-making process. Given that the accounting process of recording business transactions may arise from intentional or unintentional errors that reflect the quality of financial statements, and, accordingly, the correct decision-making based on financial statements, there is a strong need for financial statements to be validated externally by audit firms prior to use. Apart from financial statement audit, it is common for an audit firm to offer other services which result from the competence of its auditors (tax consulting, accounting consulting, IT consulting, etc.), thereby supplementing their income.¹

Since financial statement audit is inextricably linked to capital markets, it was inaugurated in the Republic of Serbia in the process of transition to the market economy model. According to the Law on Accounting and Auditing (*Sluzbeni glasnik* 111/09, 2009, article 40), an audit firm is established in accordance with the law regulating companies and must meet the following specific conditions:

- The certified public accountants or audit firms have a majority of the governing rights,
- The audit firm is licensed to perform financial statement audits,
- The certified public accountants-founders of the audit firm and certified public accountants-employees of an audit firm are not controlled by any individuals or interest groups, in accordance with the Code of Ethics for Professional Accountants,
- The audit firm has employed the prescribed minimum number of licensed certified public accountants, and
- The audit firm is a member of the Chamber of Certified Auditors.

Although the period in which audit firms have existed in the Republic of Serbia is relatively short, especially when compared to countries with a long tradition of external audit, it has been long enough to establish certain relationships in the market for audit services and for the analysis of an audit firm's achievements.

Audit firms have been in constant development for more than a hundred years. There is a significant difference in the performance of individual audit firms, so it is common practice to carry out audit firm rankings by country in

¹ See more in: Andric, Krsmanovic, Jaksic, 2009, pp. 15-18

order to determine their current state and to investigate the drivers of audit firm performance. The ranking of audit firms by individual country is based on different performance indicators. A ranking of the top 20 audit firms in Denmark² was based on the annual revenue. The performance of audit firms is also measured by the number of employees, the number of SR-auditors, the number of partners, the number of cities where audit firms have offices, and the number of clients. In research carried out in Italy³, analysis of audit firm achievement was based on annual revenue and percentage of revenue growth rate, as well as the market share of the Big Auditors in the period 1999-2005. In a survey of audit firms in the Netherlands⁴ their performance was observed according to fee income, number of offices, number of partners, and number of professional and administrative staff. In the USA the survey “2010 Top 100 Accounting Firms” disclosed the rank of 100 audit firms according to net revenue in 2010, followed by additional information such as the percentage of changes in revenue and the number of offices.⁵ In the UK Paul Grant published “Top of the Pile”⁶ in which he ranked 100 audit firms by the amount of fee income realized in 2009. Trends in fee income, income structure, annual profit, number of offices, number of certified auditors, number of employees, average salaries of audit staff, and gender structure of employees were also investigated.

The main objective of this paper is to gain an insight into the fundamental performance of audit firms in the Republic of Serbia through the analysis of the overall and individual achievements of audit firms in the period 2008-2010, based on performance indicators presented in the above-mentioned surveys. This paper is the extension of previous research into the performance of audit firms in the Republic of Serbia in 2008-2009.⁷ First, the paper will explore trends in the number of audit firms from their establishment to the present. Then the ranking of audit firms according to operating revenues, number of employees, and net income for the period 2008-2010 will be established in order to recognize the dominant audit firms operating in the Serbian market. Special emphasis will be placed on the work of audit firms that belong to the so-called “Big Four” in relation to other audit firms. Since these firms have a dominant influence at the global level, the objective of the paper is to determine the extent to which the “Big Four” audit firms influence the market and services of audit firms in the Republic of Serbia.

2 See more in: Holm, Warming-Rasmussen, 2008, pp. 49-50

3 See more in: Cameran, 2008, pp. 153-155

4 See more in: Moody, Maher, 2009, pp. 10-16

5 See more in: Inside Public Accounting, 2010, pp. 3-6

6 See more in: Grant, 2010, pp. 13-16

7 See more in: Jaksic, Mijic, 2010, pp. 75-84

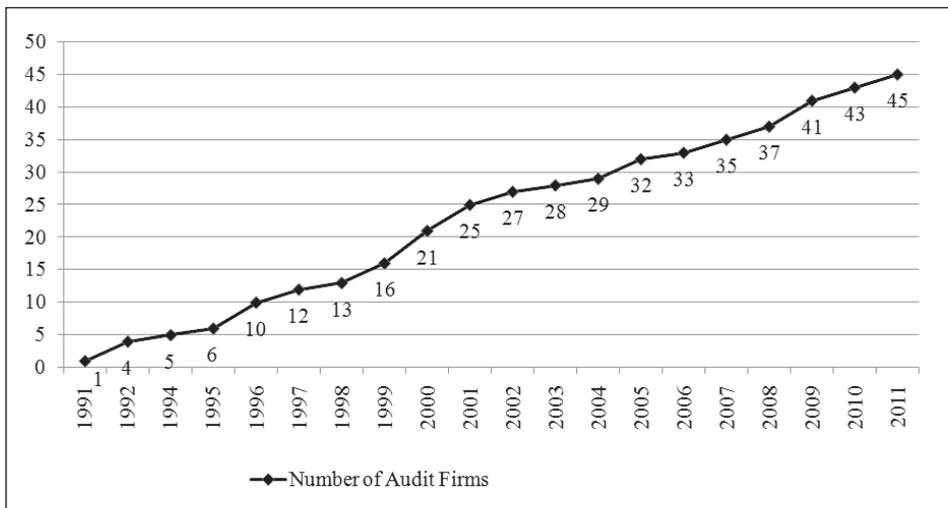
Further, the paper will investigate whether the operating revenues, employment, and net incomes of audit firms in the period 2008-2010 are correlated with each other. If the correlation analysis is negative we will try to identify factors that may explain the unusual behaviour of the observed variables.

The analysis of the performance of audit firms included all audit firms in the Republic of Serbia. For the purpose of analysis we used publicly available data from audit firm registers held by the Chamber of Certified Auditors and the Ministry of Finance of the Republic of Serbia, as well as data from audit firm financial statements for 2008, 2009, and 2010, available on the website of Serbian Business Registers. Data availability was a significant restraining factor for more comprehensive analysis.

2. AUDIT FIRMS IN THE REPUBLIC OF SERBIA

The first company to provide audit services in the Republic of Serbia, Deloitte, doo Belgrade, was established in 1991. This was followed by the establishment of other audit companies. Figure 1 presents the trend in the number of audit firms in the Republic of Serbia from the establishment of the first audit firm to 2011.

Figure 1: Trends in Number of Audit Firms in the Republic of Serbia in the Period 1991-2011



Source: Authors' construct according to data from Audit Firms Register held by Chamber of Certified Auditors, Republic of Serbia, Retrieved July 16, 2011, from <http://www.kor.rs>

It is very common to divide all audit firms into the so-called “Big Four” and other audit firms. The “Big Four” consists of the four globally dominant audit firms: 1. Deloitte, 2. PriceWaterhouseCoopers, 3 Ernst&Young, and 4. KPMG. This division of audit firms is applicable to the audit services market in the Republic of Serbia. Apart from the “Big Four” there are also some audit firms that are networked with international auditing firms, and other local audit firms.

According to the data of the Chamber of Certified Auditors and The Ministry of Finance, there are 45 firms registered in the Republic of Serbia that provided audit services in 2011. In 2011 three new audit firms were established, and one audit firm lost its license to perform financial statement audits. The following table shows the structure of audit firms by size.

Table 1: Summary of Audit Firms by Size According to Current Classification of the Republic of Serbia

	Small-sized Firms	Medium-sized Firms	Total
1. As of December 31, 2010	39	4	43
2. Lost license to perform audit in 2011	(1)		(1)
3. Audit firms established in 2011	3		3
Total (1 - 3)	41	4	45

Source: Authors’ calculation according to data from Business Registers Agency, Retrieved July 16, 2011, from <http://www.apr.gov.rs>

Despite the development of the audit service market in the Republic of Serbia, the previous table reveals that, according to the classification given in the Law on Accounting and Auditing, no audit firm belongs to the group of large-sized companies, there are only four audit firms that meet the criteria for medium-sized companies (so-called “Big Four”), and other audit firms are small-sized: which indicates the relative underdevelopment of the market of audit and related services.

If we analyze the audit firms according to location, we observe a concentration of audit firms in the capital city (see Table 2):

Table 2: Summary of Audit Firms in the Republic of Serbia According to Location

No.	Location	Number of Audit Firms	Distribution of Audit Firms According to Location
1.	Belgrade	39	86.67%
2.	Novi Sad	4	8.89%
3.	Vrnjacka Banja	1	2.22%
4.	Zrenjanin	1	2.22%
	Total (1 - 4)	45	100.00%

Source: Authors' calculation according to data from Business Registers Agency, Retrieved July 16, 2011, from <http://www.apr.gov.rs>

That does not mean that all auditors based in Belgrade necessarily work there, since some auditors do not come every day to the headquarters. This territorial dislocation of audit firms can be optimized since this is a country with relatively small territory.

3. ANALYSIS OF OPERATING REVENUE OF AUDIT FIRMS IN THE PERIOD 2008-2010

The scope of audit firms' work can be measured by their operating revenue. Operating revenue is an indicator of the market share of individual audit firms and is the basis for the ranking of audit firms by their significance.

Table 3: The Ranking of Audit Firms in the Republic of Serbia According to Operating Revenues in the Period 2008-2010 (top 10)

Audit Firm	Total Three-year Operating Revenue	Operating Revenue by Years		
		2010	2009	2008
1. Deloitte	2,767,160	853,053	871,460	1,042,647
2. KPMG	2,074,269	776,035	730,979	567,255
3. Ernst & Young	1,429,203	486,334	499,505	443,364
4. PricewaterhouseCoopers	1,356,865	510,282	445,521	401,062
5. BDO	728,605	189,187	241,137	298,281
6. Moore Stephens revizija i racunovodstvo	430,906	148,686	151,021	131,199

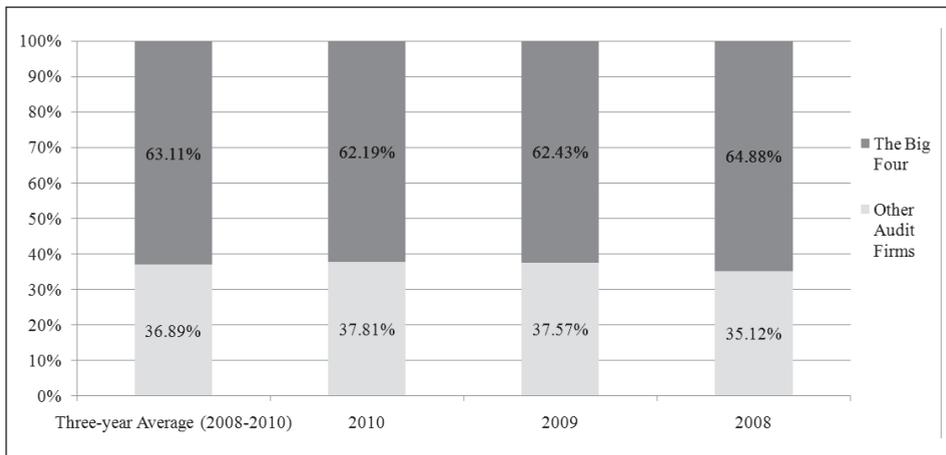
AUDIT FIRM PERFORMANCE IN THE REPUBLIC OF SERBIA

7. Confida-Finodit	358,457	130,545	121,888	106,024
8. EuroAudit	279,160	89,099	105,406	84,655
9. PKF	187,421	67,559	63,264	56,598
10. Privredni Savetnik-revizija	186,058	62,214	66,126	57,718

Source: Business Registers Agency

Based on data from the financial statements of audit firms for the period 2008-2010 it can be observed that, as expected, the largest market share belongs to the “Big Four” audit firms. Market concentration can be recognized in the following figure, which shows an overview of the operating revenue of the “Big Four” audit firms compared to all other audit firms.

Figure 2: The Share of Audit Firms in Total Operating Revenue in the Republic of Serbia in the Period 2008-2010



Source: Authors' calculation, Business Registers Agency

Although the number of other audit firms is significant (in 2010 there were 39 other audit firms), the “Big Four” audit firms accounted for almost two-thirds of the operating revenues of all audit firms in the observed period. The previous figure also shows that, although the share of large audit firms is still significant, it has decreased from year to year, although not to any significant degree.

4. ANALYSIS OF NUMBER OF EMPLOYEES IN AUDIT FIRMS IN THE PERIOD 2008-2010

One of the most important characteristics of an audit firm is that the quality of its work largely depends on the quality of its human resources. Certified public accountants have a central role in financial statement audits. According to the Law on Accounting and Auditing (Službeni glasnik 111/09, 2009, article 38), financial statement audits are carried out by persons who have a professional title in accordance with the law; that is, certified public accountants who are licensed to engage in financial statement audits, who are employed in an audit firm, and who are members of the Chamber of Certified Auditors.

In addition to certified public accountants, audit managers and audit assistants also participate in the financial statement audit. Audit firms also employ other administrative staff who are not directly engaged in audits.

The following table provides an insight into the number of employees in audit firms in the Republic of Serbia in 2010.

Table 4: Overview of the Number of Employees in Auditing Firms in the Republic of Serbia, 2010

No.	Number of Employees	Number of Audit Firms	Distribution of Audit Firms According to the Number of Employees
1.	– 5	14	32.56%
2.	6 – 10	7	16.28%
3.	11 – 20	10	23.26%
4.	21 – 50	6	13.95%
5.	51 –	6	13.95%
	Total (1 - 5)	43	100.00%

Source: Authors' calculation according to data from financial statements as of December 31, 2010, Business Registers Agency

There are significant differences in the number of employees in audit firms. The following table shows the ranking of the ten audit firms with the largest number of employees in the period 2008-2010.

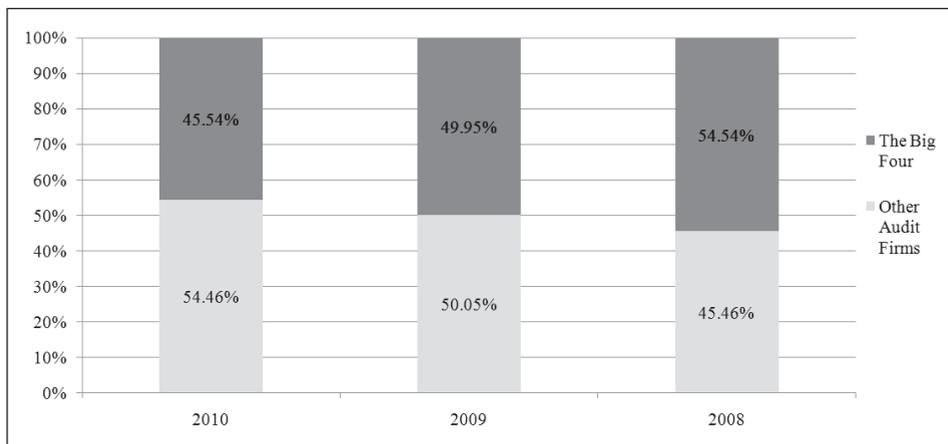
Table 5: The Ranking of Audit Firms in the Republic of Serbia According to the Number of Employees in the Period 2008-2010 (top 10)

No.	Audit Firm	Number of Employees by Year		
		2010	2009	2008
1.	Deloitte	146	151	166
2.	KPMG	135	144	142
3.	Ernst & Young	109	118	117
4.	BDO	85	75	71
5.	PricewaterhouseCoopers	69	64	62
6.	Moore Stephens revizija i racunovodstvo	51	48	43
7.	Confida-Finodit	42	35	31
8.	EuroAudit	29	26	25
9.	Baker Tilly WB revizija	25	17	11
10.	PKF	24	24	20

Source: Business Registers Agency

A summary of audit firms by number of full-time employees shows that the “Big Four” audit firms and BDO have the highest number of employees. The ranking of audit firms by number of full-time employees does not show significant variation in the period 2008-2010. However, it is evident that the number of employees in the largest audit firms has decreased (the first three audit firms on the list), while the number of employees in other audit firms is constantly growing. The following figure provides a comparative overview of the number of employees in the “Big Four” and other audit firms.

Figure 3: Number of Employees in Audit Firms in the Republic of Serbia in the Period 2008-2010



Source: Authors' calculation, Business Registers Agency

The data indicate changes in the structure of employees by audit firm. Although there are no significant differences in the sequence of audit firms by number of employees, it can be observed that the participation of employees in small audit firms grew (from 45.46% in 2008 to 54.46% in 2010), and the number of employees in “Big Four” audit firms declined (from 54.54% in 2008 to 45.54% in 2010).

5. ANALYSIS OF NET INCOME OF AUDIT FIRMS IN THE PERIOD 2008-2010

Although financial statement audits are based on the idea of serving the public interest, for long-term survival an audit firm must realize a positive operational result. Analysis of the net income/net loss of audit firms in the Republic of Serbia in the period 2008-2010 shows that the audit firms mostly realized net income.

Table 6: Grouping of Audit Firms in the Republic of Serbia According to Realized Net Income for the Period 2008-2010

No.	Realized Net Result	Number of Audit Firms by Years		
		2010	2009	2008
1	Net income	39	39	38
2	Net loss	3	4	2
3	Neutral net result	1		1
	Total (1 - 3)	43	43	41

Source: Business Registers Agency

Out of 43 audit firms that disclosed their financial statements as of December 31, 2010, 39 audit firms reported net income, three reported net loss, and one audit firm had a neutral net result. The situation in the preceding two years was similar, which is reason for optimism about the future of the audit profession (especially if these results were accompanied by serving the public interest). Table 7 shows the ranking of the top ten audit firms by net income for the period 2008-2010.

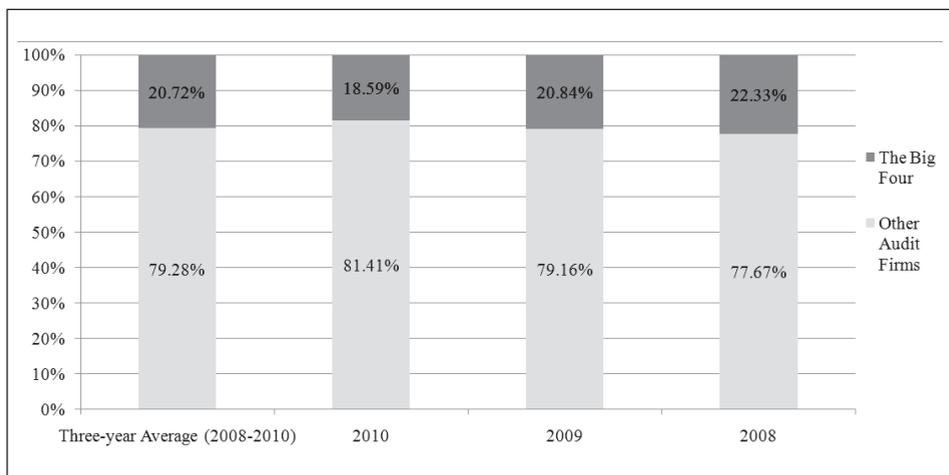
Table 7: The Ranking of Audit Firms in the Republic of Serbia According to Realized Net Income in the Period 2008-2010 (top 10)

No.	Audit Firm	Total Three-year Net Income	Net Income by Years		
			2010	2009	2008
1.	BDO	118,781	12,775	47,871	58,135
2.	Ernst & Young	113,793	2,514	46,697	64,582
3.	Moore Stephens revizija i racunovodstvo	107,022	31,727	40,443	34,852
4.	DST - Revizija	78,050	25,798	27,914	24,338
5.	EuroAudit	68,336	20,196	26,333	21,807
6.	Revizorska kuca - Auditor	65,578	16,573	7,993	41,012
7.	Confida-Finodit	61,456	21,858	20,227	19,371
8.	PKF	61,294	13,852	16,899	30,543
9.	Pan revizija	52,220	18,108	19,696	14,416
10.	PricewaterhouseCoopers	48,050	31,587	8,672	7,791

Source: Business Registers Agency

Figure 4 identifies the share of the “Big Four” audit firms in the net income of all audit firms in the period 2008-2010.

Figure 4: Share in Net Income of All Audit Firms in the Republic of Serbia in the Period 2008-2010



Source: Authors' calculation, Business Registers Agency

There are strong indications of a relatively small share of the “Big Four” audit firms in the net income of all audit firms (three-year average is 20.72%). In addition, the net income share of the “Big Four” audit firms decreased in the period 2008-2010 (from 22.33% in 2008 to 18.59% in 2010). These results are unexpected since the “Big Four” audit firms have strong negotiation powers and much higher fees than smaller audit firms.

6. ANALYSIS OF OTHER PERFORMANCE INDICATORS OF AUDIT FIRMS IN THE PERIOD 2008-2010

Analysis of audit firms can be accompanied by additional financial and workload indicators, which can reveal significant characteristics and trends in their performance. Financial indicators are presented in the following table.

Table 8: Financial Indicators of Audit Firm Performance in the Republic of Serbia in 2010

No.	Audit Firm	Operat. Revenue	Growth Rate (%)	Net Income	No. of Certif. Auditors	Oper. Rev. / No. of Certif. Audit.	Net Inc. / Oper. Rev. (%)
1	Deloitte	853,053	-2.11%	11,725	11	77,550	1.37%
2	KPMG	776,035	6.16%	19,738	12	64,670	2.54%
3	Ernst&Young	486,334	-2.64%	2,514	6	81,056	0.52%
4	PriceWaterhouseCoopers	510,282	14.54%	31,587	7	72,897	6.19%
5	BDO	189,187	-21.54%	12,775	9	21,021	6.75%
6	Moore Stephens revizija i racunovod.	148,686	-1.55%	31,727	9	16,521	21.34%
7	Confida-Finodit	130,545	7.10%	21,858	3	43,515	16.74%
8	EuroAudit	89,099	-15.47%	20,196	5	17,820	22.67%
9	Baker Tilly WB revizija	69,179	15.97%	3,956	4	17,295	5.72%
10	IEF	68,720	21.02%	12,732	5	13,744	18.53%
11	Others	900,776	13.15%	183,810	74	12,173	20.41%
	Total (1-11)	4,221,896	3.46%	352,618	145	29,117	8.35%

Source: Authors’ calculation, Business Registers Agency, The Ministry of Finance of The Republic of Serbia

Even though the “Big Four” realized the largest operating revenue in 2010, the situation is not the same according to other performance measurements. The growth rate for all audit firms in 2010 was 3.46%, while the revenues of the

five audit firms from the top ten (including Deloitte and Ernst & Young) have decreased. Furthermore, according to percentage of net income in operating revenue, the “Big Four” audit firms had rates below average.

The table also shows that the most significant audit firms have significantly higher operating revenue generated per certified auditor. This can be explained by the higher fees of these audit firms.

Workload performance indicators of audit firms in Serbia are presented in the next table.

Table 9: Workload Performance Indicators of Audit Firms in the Republic of Serbia in 2010

Observed data	Number of audit staff					Total
	1-5 (I)	6-10 (II)	11-20 (III)	21-50 (IV)	More than 50 (V)	
Number of audit firms in group	13	7	9	8	4	41
Number of audit staff	44	58	132	239	289	762
Number of CPAs	17	23	39	43	39	161
Number of audit engagements	753	847	1,506	2,067	613	5,786
% of total audit engagements	13%	15%	26%	36%	10%	100%
Number of engagements per auditor	17.1	14.6	11.4	8.6	2.1	7.6
Number of engagements per CPA	44.3	36.8	38.6	48.1	15.7	35.9
Average engagement of an auditor per audit (in days)	7.5	8.8	11.2	14.9	61	16.8
Average engagement of a CPA per audit (in days)	2.9	3.5	3.3	2.7	8.2	3.6

Source: Authors’ calculation, Business Registers Agency, Chamber of Certified Auditors

This table reveals differences in the workload of audit firms depending on their size. Smaller audit firms (group I) have audit teams with relatively high participation of CPAs in total audit staff. These audit firms do not spend a lot of resources on audit engagements (one member of audit staff spends 7.5 days per

audit engagement and CPA spends 2.9 days). Medium audit firms (groups II, III and IV) carry out a significant portion of all audit engagements (77% of total audit engagements) with average number of audit staff and CPAs. The biggest audit firms have a lot of audit staff and proportionally smaller participation of CPAs in total audit staff. The average engagement of audit staff and CPAs per one audit is high (one member of audit staff spends 61 days on one audit engagement and CPA spends 8.2 days). The biggest audit firms carry out only 10% of total audit engagements.

7. ANALYSIS OF VARIATION IN OPERATING REVENUE, NUMBER OF EMPLOYEES, AND NET INCOME OF AUDIT FIRMS

Based on individual and aggregated data of audit firms, it is possible to perform a variety of analyses that show the condition and operating results of activities, as well as fluctuations in the indicators of individual audit firms. Fluctuations in value categories indicate huge differences in the items of balance sheets and income statements of audit firms. In this respect, we cannot anticipate the expected financial statements of audit firms.

The following table provides an overview of operating revenue, number of employees, and net income of all audit firms for the three consecutive years.

Table 10: Operating Revenue, Number of Employees, and Net Income of All Audit Firms in the Republic of Serbia in the Period 2008-2010

Year	Operating Revenue		Number of Employees		Net Income	
	000 RSD	Index to Previous Year	Number	Index to Previous Year	000 RSD	Index to Previous Year
2008	3,783,142	-	893	-	431,146	-
2009	4,080,669	107.86%	955	106.94%	413,466	95.90%
2010	4,221,896	103.46%	1,008	105.55%	352,618	85.28%

Source: Business Registers Agency

As one can observe, operating revenue and number of employees in audit firms in the Republic of Serbia increased in the observed three-year period, while the net result decreased constantly. Operating revenue in 2009 increased compared to 2008 by 7.86%, while growth in 2010 decreased slightly by 3.46% compared to 2009. The number of employees in audit firms increased fairly constantly in the

observed period (in 2009 by 6.97%, and in 2010 by 5.55%). When the net results of the audit firms are taken into consideration, even though the vast majority of audit firms had a positive net result of operations in all three observed years, the total net income from year to year decreased (in 2009 it decreased compared to 2008 by 4.10%, and in 2010 it decreased compared to 2009 by as much as 14.72%).

By applying correlation analysis⁸, the correlation between the operating revenue generated by audit firms, the number of employees, and the net income of audit firms for the period 2008-2010 was examined.

Table 11: Correlation between Operating Revenue, Number of Employees, and Net Income of Audit Firms in the Republic of Serbia in the Period 2008-2010

Variable 1	Variable 2	Correlation Coefficient by Years		
		2010	2009	2008
Operating revenue	Number of employees	0.9547	0.9742	0.9624
Operating revenue	Net income	0.3981	0.4321	0.3045
Number of employees	Net income	0.4197	0.5454	0.4381

Source: Authors' calculation, Business Registers Agency

The results of the correlation analysis indicate the following:

- a) There is a strong positive correlation between operating revenue and number of employees,
- b) There is no significant correlation between operating revenue and net income, or between the number of employees and net income.

- a) The correlation between operating revenue and employment.

The correlation coefficient between operating revenue and number of employees was 0.9624 for 2008, 0.9742 for 2009, and 0.9547 for 2010. Based on the values of the correlation coefficient⁹, it can be concluded that there is a very high (strong) direct linear relationship between the number of employees and operating revenue, which means that more employees realize higher operating revenue.

- b) Lack of correlation between operating revenue and net income, and between the number of employees and net income.

⁸ See more in: Newbold, Carlson & Thorne, 2010, p.182

⁹ See more in: Žižić, Lovrić & Pavličić, 2006, p. 308

The correlation coefficient between operating revenue and net income was 0.3045 for 2008, 0.4321 for 2009, and 0.3981 for 2010. The correlation coefficients between operating revenue and net income indicate a relatively weak direct correlation between the observed variables.

The correlation coefficient between number of employees and net income was 0.4381 for 2008, 0.5454 for 2009, and 0.4197 for 2010. The correlation coefficients between the number of employees and net income indicate a relatively weak direct correlation between the observed variables (although slightly higher than the correlation between operating revenue and net income).

Thus it can be observed that net income is not statistically significantly correlated with operating revenue and number of employees. The results of correlation analysis are not in line with expectations, given that the size of audit firms and the extent of work performed should correspond to the profitability of operations.

One logical explanation could be that there is a significant difference in the performance of existing and newly established audit firms. Audit firms that were established earlier have built their market position. They have permanent clients, stable operations, and higher fees. Newly established audit firms struggle for contracts in the market. They do not have a lot of clients. In order to enter the market, they have strategies of lower fees and lower work performance. As a result a significant difference in operating revenue, number of employees, and net income between newly established audit firms and audit firms established earlier is expected.

In order to statistically validate this assumption we divided the audit firms into two groups. The first group consisted of audit firms established before 2001 and the second group of audit firms founded after 2001. After grouping audit firms, t-test with two-sample assuming unequal variance of operating revenue, number of employees, and net income in 2010 was carried out. The test gave the following results.

a) T-test for operating revenue

Null hypothesis: There is no significant difference in means for the two groups, i.e. $H_0: \mu_1 = \mu_2$, where $\mu_1 =$ mean of operating revenue in 2010 of audit firms in the Republic of Serbia established before 2001

μ_2 = mean of operating revenue in 2010 of audit firms in the Republic of Serbia established after 2001

Table 12: T-test: Two-Sample Assuming Unequal Variance
(Operating Revenue in 2010)

	Group 1	Group 2
Mean	157,448	15,872
Variance	55,378,791,400	237,250,208
Observations	25	18
Hypothesized Mean Difference	0	
df	24	
t Stat	2.99915	
P(T<=t) one-tail	0.00311	
t Critical one-tail	1.71088	
P(T<=t) two-tail	0.00622	
t Critical two-tail	2.06390	

Source: Authors' calculation, Business Registers Agency

The performed t-test gave P (T<=t) two-tail of 0.00622, which is less than a margin of 0.05. This indicates that null hypothesis H0 has to be rejected. Therefore, there is a statistically significant difference in the operating revenue of the two groups.

The mean of the observed groups of audit firms showed that the average operating revenue of audit firms established before 2001 was 157,448 thousand dinars in 2010, and that the average operating revenue of audit firms established after 2001 was 15,872 thousand dinars in 2010.

b) T-test for number of employees

Null hypothesis: There is no significant difference in means for the two groups, i.e. H0: $\mu_1 = \mu_2$, where

μ_1 = mean of number of employees in 2010 of audit firms in the Republic of Serbia established before 2001

μ_2 = mean of number of employees in 2010 of audit firms in the Republic of Serbia established after 2001

Table 13: T-test: Two-Sample Assuming Unequal Variance
(Number of Employees in Year 2010)

	Group 1	Group 2
Mean	36.32	5.56
Variance	1,664	21
Observations	25	18
Hypothesized Mean Difference	0	
df	25	
t Stat	3.73834	
P(T<=t) one-tail	0.00048	
t Critical one-tail	1.70814	
P(T<=t) two-tail	0.00097	
t Critical two-tail	2.05954	

Source: Authors' calculation, Business Registers Agency

The performed t-test gave P (T<=t) two-tail of 0.00097, which is less than a margin of 0.05. This indicates that null hypothesis H₀ has to be rejected. Therefore, there is a statistically significant difference in the number of employees of the two groups.

The mean of the observed groups of audit firms showed that the average number of employees in audit firms established before 2001 was 36.32 in 2010, and that the average number of employees in audit firms established after 2001 was 5.56 in 2010.

c) T-test for net income

Null hypothesis: There is no significant difference in the mean for the two groups, i.e. H₀: $\mu_1 = \mu_2$, where

μ_1 = mean of net income in 2010 of audit firms in the Republic of Serbia established before 2001

μ_2 = mean of net income in 2010 of audit firms in the Republic of Serbia established after 2001

Table 14: T-test: Two-Sample Assuming Unequal Variance
(Net Income in 2010)

	Group 1	Group 2
Mean	12,149	2,716
Variance	87,498,369	22,509,015
Observations	25	18
Hypothesized Mean Difference	0	
df	37	
t Stat	4.32836	
P(T<=t) one-tail	0.00005	
t Critical one-tail	1.68709	
P(T<=t) two-tail	0.00011	
t Critical two-tail	2.02619	

Source: Authors' calculation, Business Registers Agency

The performed t-test gave P (T<=t) two-tail of 0.00011, which is less than a margin of 0.05. This indicates that null hypothesis H₀ has to be rejected. Therefore, there is a statistically significant difference in the net income of the two groups.

The mean of the observed groups of audit firms showed that the average net income of audit firms established before 2001 was 12,149 thousand dinars in 2010, and that the average operating revenue of audit firms established after 2001 was 2,716 thousand dinars in 2010.

The performed t-tests showed that in 2010 there was a significant difference in operating income, number of employees, and net income of newly established audit firms and previously established audit firms. Therefore, it can be concluded that when an audit firm was founded has a significant influence on the firm's performance.

8. CONCLUSIONS

After the legal inauguration of financial statement audits in the Republic of Serbia as a service provided by independent audit firms, a steady increase in the number of audit firms has been noted, which is predominantly characterized by the registration of audit firms in the capital city.

The increase in the number of audit firms is, to a significant extent, a consequence of an environment in which the majority of audit firms had a positive net income

(39 audit firms out of 43 reported a positive net income in 2010). Positive income was achieved along with increases in audit firm operating revenue and number of employees in the observed period (2008-2010).

However, apart from these positive trends, certain negative indicators can also be observed. Specifically, the cumulative net income of audit firms from year to year constantly declined. The reasons for this negative trend can be traced to the difficult economic conditions of audit clients and the general lack of liquidity in the national economy, as well as in the competition (often unfair) between audit firms, which is accompanied by a lack of instruments for regulating the audit profession (the absence of litigation against audit firms, the lack of independent quality control and public oversight, etc.).

Audit firms that belong to the so-called “Big Four” are dominant in the market in the Republic of Serbia, but they also showed uneven participation in operating revenue, number of employees, and net income of total audit firms.

Correlation analysis of relations between operating revenue and number of employees in the period 2008-2010 showed a high degree of positive correlation between these variables, which can lead to two conclusions. First, audit firms have a policy of employment in accordance with workload; and, second, recognition of the largest audit firms in the Republic of Serbia can be based either on data of operating revenue or of number of employees, without affecting the conclusions about the significance of audit firms.

Contrary to expectations, the correlation analysis showed the absence of a significant correlation between net income of audit firms and their operating revenue and number of employees. This means that the realized net income of an audit firm in the Republic of Serbia cannot be explained by the scope of its operations. It is therefore necessary to look for other factors.

Qualitative analysis of the causes of changes in operating revenue, number of employees, and net income revealed that the length of time in which audit firms had provided services in the market had a significant impact on the achieved results. Specifically, the analysis of operating revenue, number of employees, and net income of audit firms by year of their establishment showed that audit firms that were established later had achievements under average. The main reason for this can be found in the fact that the market for audit firm services is already satisfied and that the relatively small number of new audit clients available to the

newly established audit firms makes it difficult for them to survive in the market and to achieve above average performance.

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