



## **THE ROLE OF <<BIG FOUR>> AUDITING FIRMS IN THE PUBLIC PROCUREMENT MARKET IN UKRAINE**

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*Submission: 8/21/2020*

*Revision: 8/31/2020*

*Accept: 9/8/2020*

### **ABSTRACT**

The authors conducted a study aimed to identify the role of «Big Four» («Big 4») audit firms in the public procurement market in Ukraine. The purpose of the article is to answer the questions: whether Ukraine is in a general trend of most countries in the concentration of audit market; what is the share of revenues of the «Big Four» audit firms in the performance of audit services in the public procurement system in Ukraine. First of all, in order to get answers to these questions, the authors conducted a study of the main trends in the development of the «Big Four» companies in Ukraine. It was found that the characteristic competitive environment in the market of audit services, the impact on competitiveness of pricing policy and regulatory requirements, relating to the acquisition of audit services by public sector entities through a public procurement system "ProZorro".



An element of price regulation and compliance with the transparent conditions of the competitive environment is the participation of audit firms in the public procurement system. As a result of processing data on procurement of audit services for the period 2008-2019, the authors calculated key indicators that characterize the concentration of the audit market. Based on the data on the amount of remuneration for various types of audit services using the public procurement system "ProZorro", aspects of pricing policy and the role of the companies of the "Big Four" in the market were established. The values indexes indicate that the companies of the «Big 4» do not have a complete monopoly in the segment of procurement of audit services, having certain dominant positions in some years, and the indexes indicate a trend towards effective competition in the audit services market in Ukraine.

**Keywords:** Audit; Audit services; Audit market concentration; Public procurement market

## 1. INTRODUCTION

The issues of the development of audit services on the quantitative and qualitative indicators remain the subject of consideration of scientists in many countries of the world. The «Big four» accountants continue to dominate the UK auditing market. EY, KPMG, PwC, and Deloitte — collectively known as the «Big Four» («Big 4») — audited 81.8% of all UK-listed businesses in 2018, according to figures from the Financial Reporting Council (FRC). The «Big four» also audited 100% of the FTSE 100, Britain's 100 biggest listed businesses, up from 99% in 2017.

Scientific publications testify to the research of the market of audit services in the Anglo-Saxon countries, but to date, only a few studies are focused on the European countries. Attention is paid to the study of the changes in the market of audit services in Ukraine. However, in each country, the development of the market acquires national peculiarities and characteristics. Evidence for this is the publication of scientists from many countries devoted to the identification of trends in the development of audit and other audit services.

## 2. LITERATURE REVIEW

There is a serious problem of pricing of audit services, namely in terms of methods of determining it. There is no single system for calculating the cost of audit firm services in Ukraine, so auditors use their own pricing systems. Also, the large number of auditors in the market causes a decrease in the price of audit services due to the competition, which leaves the



issue of pricing relevant. This is a factor of competition, an element of legal regulation, the basis for determining the quality of services based on the market value for money.

Prices have a significant effect on the independence of the auditor, especially when the price is a significant part of the total fees of the audit firm, as there is dependence on such a client and the risk of losing it.

A separate area of research carried out by researchers abroad is related to the analysis of the relationship between the size of the audit firm, quality of services and pricing policy. Thus, the authors (CHOI et al., 2010) using the results of audit firms in the US over a five-year period found that the size of the audit firm is a specific factor influencing the quality and rewards at the level of audit firms and at the level of the territory of activity. The size of the audit firm affects the number of clients, as well as the fees received.

The results showed a close relationship between the size of the audit firm and the revenue received, and large branches of audit firms provide higher quality services compared to small local offices of audit firms. A study on the relationship between audit fees and audit quality (CHOI; KIM; ZANG, 2010) in 2010 indicates that there is no significant relationship between audit fees and the quality of audit services. The results of another study suggest those auditors' incentives to refrain from bias in the formulation of audit reports may vary depending on whether clients pay more or less than the usual fee for audit services.

The direction of foreign scholars in the study of pricing in the field of audit services concerns the analysis of the organizational and legal form of the client and the impact on the formation of the value of audit services (BILLINGS; XINGHUA; JIA, 2014), as well as the type of audit services, in particular the study of Bloomfield and Shackman (2008), Cahan et al. (2008).

In the geographical context, the issues of pricing policy of audit services are relevant for scholars from different countries, including Great Britain, Germany (BIGUS; ZIMMERMANN, 2008), New Zealand (ZHANG; EMANUEL, 2008) and others. In general, such studies lead scientists to the conclusion that it is necessary to develop a model for pricing audit services.

Particular emphasis on the role of audit committees in selecting audit firms and agreeing on the cost of audit services is made in the work of Aboott et al. (2010).



Some authors, Adelopo (2009) among them, present the results of research on the existence of a positive relationship between the cost of audit services and the cost of other audit services provided by auditors to the client.

Authors Ojala et al. (2014) analyzed the relationship between audit quality and the affiliation of audit firms. Yes, there is conflicting evidence on this issue.

On the one hand, audit firms have better knowledge of regional issues and provide more services and advice than auditing financial statements.

On the other hand, the authors suggest that when «Big Four» companies serve small clients, they do not entrust this work to key auditors or transfer orders from one employee to another, which cannot be considered as quality improvement. In contrast, other audit firms are more careful about serving small clients, which correlate with improved service delivery.

According to Bierstaker, Houston and Wright (2006) over the past 25 years, the audit environment has been intensely competitive as a result of bidding, advertising and consolidation. In the past, many observers and independent commissions responsible for evaluating the audit profession have argued that a stable market, or even falling markets, has forced auditors to rely heavily on other lucrative audit services, such as consulting, taxation, but which can also raise the question of the independence of the auditor.

**The purpose of the article** is to answer the questions: whether Ukraine is in a general trend of most countries in the concentration of audit market; what is the share of revenues of the «Big Four» audit firms in the performance of audit services in the public procurement system in Ukraine

### 3. DATA AND METHODOLOGY

This theoretical paper is based on the study of literature about audit market concentration in Ukraine and the role of «Big 4» companies, namely in the public procurement market.

The main research methods are abstract-logical for theoretical generalizations of scientific research results and formulation of conclusions, economic and statistical calculations of concentration indices, Herfindahl-Hirschman index, entropy index to study the dynamics and the structure of the audit market. The publications on the previous year about audit market concentration and regulatory documents in Ukraine was adopted as a basis in order to form the hypothesis.



The article presents results of the empirical study, which used the official statistical information from special resource «ProZorro» (DATABASE PROZORRO, 2020) during 2008-2019 years, as well as research of legal documents and documents of the professional organization of auditors of Ukraine (AUDIT CHAMBER OF UKRAINE, 2020). The introduction of e-procurement in Ukraine, including auditing services, using the «ProZorro» has enabled small and medium-sized businesses to participate in tenders, which has increased competition between participants, including «Big 4» audit companies. Thus, sources of information were obtained for further comparison.

Using the static database that characterizes the market of audit services in Ukraine, the indexes of concentration were established.

The research was quite representative to show the impact of big audit firm («Big 4») in the public procurement market in Ukraine. Thus, sources of information were obtained for further conclusions.

#### **4. RESULTS AND DISCUSSIONS**

The market audit and audit services market in Ukraine has its own national and regional features, as it is represented by domestic and international audit firms, as it was mentioned in previous work of Khorunzhak et al. (2020).

The «Big Four» companies also operate in Ukraine.

Official data of the Audit Chamber of Ukraine (AUDIT CHAMBER OF UKRAINE, 2020) indicate an uneven distribution of audit services provided by audit firms (auditors), as well as significant fluctuations in the number and cost of services in different regions, which in most cases depends on the concentration of industrial enterprises, solvency of audit clients and their understanding of cost and the quality of audit services.

Most of the audit firms in Ukraine determine the cost of audit services based on the time spent by auditors required for the quality implementation of a particular type of work or service, their complexity and urgency. The scope of work depends on the complexity of the task, type and field of activity of the business entity, the quality of the organization of accounting and the work of its accounting service, the number of primary documents, the presence of atypical or specific business transactions, etc. It is a part of the management, especially for small audit firms (RODRIGUES, 2013).



Despite the significant influence of the representatives of the "Big Four" on the competition and the structure of the audit services market in Ukraine, their corporate strategies, positioning and competitiveness indicators of domestic scientists have not been studied. The strategies of audit firms, or rather networks of independent audit firms united under multinational brands, can be most fully analyzed in Ukraine, which allows to assess their effectiveness and identify shortcomings and reasons for their loss of competitiveness. Revenues of each of the four companies during 2016–2018 steady growth (table 1).

At the same time, during 2016–2018, the rating of brands by income level remained unchanged:

- 1st place - Deloitte,
- 2nd place - PwC,
- 3rd place - Ernst & Young,
- 4th place – KPMG (BIG 4 ACCOUNTING FIRMS RANKING, 2019).

Table 1: Revenues of the Big Four companies for the period 2016-2018, billion dollars

Company	Income received, billion dollars		
	2016	2017	2018
Deloitte	36,9	38,8	43,2
PwC	35,4	37,7	41,3
Ernst&Young	29,6	31,4	34,8
KPMG	25,4	26,4	28,9
Total	127,3	134,3	148,2

Source: Big 4 Accounting Firms Ranking (2019)

Regulators around the world and especially in Europe struggle with difficulties in the development of competition due to the large differences in the workload of the «Big Four» and mid-level audit firms.

For example, UK regulators have repeatedly tried to address this issue, but have not been able to find concrete solutions. In the UK, the Audit Competition Commission has been set up according to which it is difficult for companies to compare alternatives to existing auditor. Because of this they prefer continuity of work with a single auditor to incurring significant costs when changing auditors. In the process, companies invest in a relationship of mutual trust and confidence. They do not want to leave a long –team relationship, which will lead to the loss of the benefits of continuity.

Big Four audit firms dominate the markets, and firms outside of this group find it difficult to demonstrate sufficient experience and, knowledge, and get contract as a result.



According to research by the British Competition Commission on the auditing profession, evidence of the so-called "restrictive conditions" is published, when the company's management is not allowed to choose auditors from among firms that are not part of the "Big Four".

The issue of setting the price for audit services remains an urgent problem. The presence of a different price range for the same service raises a number of questions in terms of the laws of the market, so the lack of mechanisms for setting the price of the audit complicates the understanding of its value to the client and slows down the ordering process.

The lack of both, national practical experience and the theoretical developments on this issue necessitates the analysis of approaches to its solution, taking into account the experience of other countries.

The lack of sufficient theoretical work on this issue requires an analysis of approaches to determining the value of not only the audit of financial statements, but also audit services.

The importance of considering this issue is emphasized by the adoption of the Law of Ukraine "On Auditing of Financial Statements and Auditing" dated 21.12.2017, № 2258-VIII, where the cost of audit services is subject to regulation much more widely than in the previous version.

The study of articles of the Law of Ukraine "On Audit of Financial Statements and Auditing" indicates the following aspects that need to be considered by the auditors in the formation of the cost of audit services:

- the contract for the provision of audit services provides for the client, scope of audit services, amount and terms of payment;
- formation of the amount of the contribution as a percentage of the amount of remuneration under each contract for the provision of audit services for mandatory audit to other legal entities which are not enterprises of public interest;
- application by auditing entities of the remuneration policy for personnel involved in the performance of statutory audit tasks, which would provide incentives to ensure the quality of work. At the same time, it is necessary to differentiate fees for services not related to the mandatory audit of financial statements and not to take them into account when forming the price of the audit for the client;



- personal records must be kept for each client whose financial statements are audited, which must include the amount of remuneration received for statutory audit services and remuneration received for other services in each financial year;
- taking into account the restrictions associated with the fee for the audit of financial statements from one client and the simultaneous provision of non-audit services;
- taking into account the restrictions associated with the formation of the total amount of remuneration received from the company of public interest for each of the last three years in a row;
- a ban on the provision of services for the statutory audit of financial statements to an enterprise of public interest, if the total amount of remuneration received from this enterprise annually exceeds 15 percent of the total net income from the provision of services by such audit entity for five years in a row;
- imposition of a fine on the subject of audit activity, which is determined from the amount of the remuneration under the contract for the provision of audit services;
- the auditing entity that conducts a mandatory audit of the financial statements must have contract of civil liability insurance to third parties. The minimum amount of insurance should be 10 percent of the amount of remuneration received under contracts for the provision of audit services for statutory audit.

The introduction of e-procurement in Ukraine, including auditing services, using the public procurement system "ProZorro", has enabled small and medium-sized businesses to participate in tenders, which has increased competition between participants. All interested parties were given access to monitoring the procurement process, and participants were given the opportunity to appeal unfair decisions. Based on the data on the amount of remuneration for various types of audit services using the public procurement system "ProZorro", aspects of pricing policy and the role of the companies of the "Big Four" in the market were established (Table 1, Figure 1). For this purpose, special indices were calculated: concentration indexes, Herfindahl-Hirschman index and entropy index.

$$\text{Concentration index } CR_n = \frac{R_1 + R_2 + \dots + R_n}{R}$$

$$\text{Herfindahl-Hirschman index } HHI = \sum_{i=1}^n \left( \frac{R_i}{R} \right)^2$$





$$\text{Industry concentration index } CCI = R_1 + \sum_{i=2}^n R_i^2 \times (1 + (1 - R_i))$$

$$\text{Entropy index } E = \frac{1}{n} \sum_{i=1}^n R_i \times \ln \frac{1}{R_i}$$

The industry concentration index is useful for assessing the relationship between market share fluctuations and the absolute importance of the share of the largest market participant; in our case we are interested in the companies of the «Big 4». The value of this index can be in the range from 0 to 1, and the higher the value of the coefficient, the more monopolized the market.

Thus, the concentration index characterizes the inequality in the market, and depending on the values of the market concentration ratio is divided into four groups:

- 1) complete monopoly at coefficient values of about 100%;
- 2) the dominance of individual firms with coefficient values from 50 to 90%;
- 3) limited oligopoly with a coefficient of 50-60%;
- 4) effective competition when the value of the coefficient is less than 40%.

Additional to use within the study is the entropy index, which allows reducing the importance of market shares of large companies, to assess the importance of small and medium-sized companies in the market of procurement of audit services. The higher the value of the entropy index, the higher the level of uncertainty from the economic point of view in the market and the lower the probability of monopoly formation.

To assess the level of monopolization of the audit services market on the public procurement platform in Ukraine, the Herfindahl-Hirschman index also used: (0 - minimum concentration, 0-0.1 - low concentration; from 0.10 to 0.18 average level of concentration, more than 0.18 - high level of concentration).

Table 2: Indicators of the Big Four companies in the process of procurement of audit services and audit services in Ukraine, thousand UAH

Year	Ernst & Young (Ukraine department)	KPMG (Ukraine department)	Deloitte Touche Tohmatsu (Ukraine)	PricewaterhouseCoopers (Ukraine department)	«Big 4», total	Other firms	Total	«Big 4»,%
2008	2510	-	-	-	2510	14353,1	19373,1	12,96
2009	8592	990,8	-	-	9582,8	7105,8	26271,4	36,48
2010	2222	3500	-	-	5722	1719,5	13163,5	43,47
2011	17000	-	-	-	17000	2427	36427	46,67



2012	-	-	-	-	0	7710,3	7710,3	0,00
2013	22568,9	-	-	-	22568,9	1234	46371,8	48,67
2014	-	-	-	-	0	160	160	0,00
2015	19807,9	-	-	-	19807,9	289,6	39905,4	49,64
2016	4440	-	6597	11580	22617	5701,5	50935,5	44,40
2017	28318,6	7577,2	4150	-	40045,8	23810,1	103901,7	38,54
2018	82321	-	12564	-	94885	32332,6	222102,6	42,72
2019	622,1	-	-	-	622,1	10575,1	11819,3	5,26

Source: compiled by the authors on the basis of DATABASE PUBLIC PROCUREMENT SYSTEM «PROZORRO», Ukraine (2020)

The concentration index characterizes the position of the largest audit firms in the audit services market. The values of this index indicate that the companies of the «Big 4» do not have a complete monopoly in the segment of procurement of audit services, having certain dominant positions in some years, and the index indicates a trend towards effective competition in the audit services market in Ukraine.

The values of the Herfindahl-Hirschman index also confirm this conclusion, indicating the average level of monopolization of the industry, and in some years with a tendency to low (Table 2).

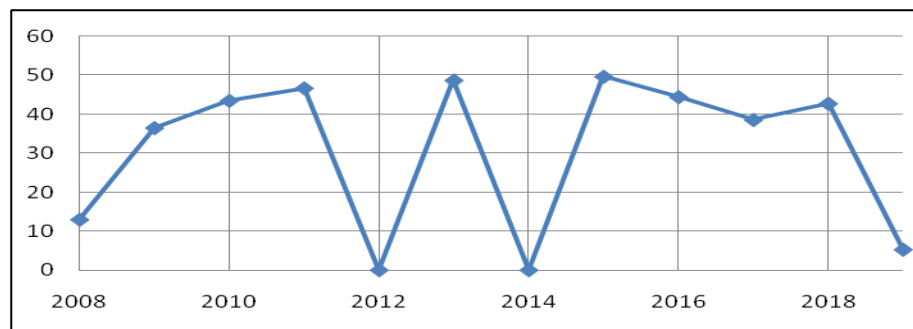


Figure 1: Participation of the «Big 4» audit firms in the process of procurement of audit and audit services in 2008-2018

Source: compiled by the authors on the basis of DATABASE PUBLIC PROCUREMENT SYSTEM «PROZORRO», Ukraine (2020)

Table 3: Concentration indexes

Year	Concentration index, (CR4), %	Herfindahl-Hirschman index (HHI)	Industry concentration index (CCI)	Entropy index, %
<b>Concentration indexes ( the indicator «Revenue»)</b>				
2008	12,96	0,017	0,130	6,62
1	2	3	4	5
2009	36,48	0,108	0,330	12,23
2010	43,47	0,099	0,291	16,31
2011	46,67	0,218	0,467	8,89
2012	0,00	0,000	0,000	0,00
2013	48,67	0,237	0,487	8,76
2014	0,00	0,000	0,000	0,00
2015	49,64	0,246	0,496	8,69
2016	44,40	0,076	0,210	20,35

2017	38,54	0,081	0,286	16,85
2018	42,72	0,141	0,377	13,26
<b>Concentration indexes (the indicator «Total of orders»)</b>				
2008	33,33	0,111	0,333	9,16
2009	33,33	0,062	0,246	14,46
2010	40,00	0,100	0,319	14,79
2011	50,00	0,250	0,500	8,66
2012	0,00	0,000	0,000	0,00
2013	25,00	0,063	0,250	8,66
2014	0,00	0,000	0,000	0,00
2015	33,33	0,111	0,333	9,16
2016	22,86	0,020	0,088	14,38
2017	7,26	0,002	0,042	6,46
2018	5,20	0,002	0,046	4,30

Source: compiled by the authors on the basis of DATABASE PUBLIC PROCUREMENT SYSTEM «PROZORRO», Ukraine (2020)

## 5. CONCLUSIONS AND RECOMMENDATIONS

Based on the data on the amount of remuneration for various types of audit services using the public procurement system «ProZorro», aspects of pricing policy and the role of the companies of the "Big Four" in the market were established.

The concentration indexes characterize the position of the largest audit firms in the audit services market.

The values indexes indicate that the companies of the «Big 4» do not have a complete monopoly in the segment of procurement of audit services, having certain dominant positions in some years, and the indexes indicate a trend towards effective competition in the audit services market in Ukraine.

The values of the Herfindahl-Hirschman index also confirm this conclusion, pointing to the average level of monopolization of the industry, and in some years with a tendency to low.

Competition forces to maintain the qualifications of staff, to attract employees of the firm who are best suited for the tasks, and, therefore, training is one of the most important factors in the competitiveness of the firm. Performing certain types of tasks requires special skills, may be associated with hiring auditors with special skills, which affects the ability to perform and offer the service which adds arguments for staff development.

The personnel issue remains to be difficult one, as training and professional growth of staff can affect a firm's ability to maintain consistent productivity. Audit firms can ensure their level of productivity by training employees with a strong initial training period. However,



competition is beneficial and forces mid-level audit firms to be competitive by providing services other than auditing.

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