

THE LEVEL OF USING ANALYTICAL PROCEDURES WITHIN INTERNAL AUDIT ENGAGEMENTS IN PROFIT- AND PUBLIC-SECTOR ENTITIES

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Abstract - The purpose of this paper is to investigate to which extent analytical procedures are used in assurance engagements of the internal audit process in profit- and public-sector entities in Croatia. The results are based on the answers of 155 internal auditors from Croatia gathered through the survey during the last quartile of the 2017. The sample that is included in the research includes chief audit executives (CAEs) and internal auditors from profit companies, financial sector, public companies, budget users at state, regional and local level. Categorical variables are tested using the Chi-square test. The obtained results show that only in performing phase of assurance engagements association is statistically significant. The research hypothesis that there is no statistically significant difference in the extent of using analytical procedures in internal audit assurance engagement between profit-sector and public-sector entities in Croatia can be only partly accepted with great caution, because the found difference in one of four observed phases.

Index Terms - Analytical Procedures, Assurance Engagements, Internal Audit, Profit-Sector Entities, Public-Sector Entities.

I. INTRODUCTION

The evolution of the internal audit function is followed by the growth and development of a company, business operations, and changes in the environment. The internal audit activity represents a significant part of an overall corporate governance mechanism. The internal audit profession must continuously develop new approaches of internal auditing; create new auditing products and services, consistent with the more complex demands and challenges facing contemporary business conditions. One of the key characteristics of the internal audit process is its integrity, which means that certain activities internal auditor performs in all phases of the auditing process. In that context, application of numerous analytical techniques and procedures in phases of planning, performing, reporting and follow-up may contribute to the quality of the overall internal audit process. "Internal auditors are required to use such analytical processes on a regular basis in the course of their audits. The idea is not to jump into an audit with an already assumed conclusion but to break down the elements of whatever data or series of events is being analyzed in order to reach a conclusion. (...) Internal auditors should use an analytical approach to describe their use of well-documented, well-reasoned processes to arrive at decisions in their internal audit activities." [1]

Undoubtedly it can be said that the development of the information technology is the most responsible for wider application of different and advanced methods of data analysis. The International Standards for the Professional Practice of Internal Auditing (Standards) does not explicitly condition application of certain

analytical procedures, conducted research and direction of professional development put them in the foreground and makes an indispensable method of detecting problem areas, collecting audit evidence, and testing the effectiveness of internal controls. In accordance with the Standards "internal auditors must base conclusions and engagement results on appropriate analyses and evaluations" [2].

Implementation guidelines of the International Professional Practices Framework (IPPF) encourage using analytical procedures in planning assurance engagements [3]. "This can help internal audit define and create an audit plan that focuses on the areas of highest concern. The internal audit activity should consider prioritizing the use of data analysis for risk assessment during the audit planning stage, where the data is available, and where this approach is applicable." [4] Supplemental guidelines emphasize that analytical procedures can be used in all phases of internal audit engagements [5]. In performing phase analytical procedures can be used as an audit evidence for assessing internal controls effectiveness, in reporting phase as a confirmation mechanism for adopting conclusions, and in follow-up they can be used as a tool for comparing reported and implemented recommendations. In planning and performing assurance engagements analytical procedures are used to identify anomalies, as unexpected fluctuations, differences and relationships, where those anomalies may be indicator of unusual and non-repetitive transactions, mistakes or frauds [6].

Definition of analytical procedures is not unambiguous and can be set quite widely. Next to term analytical procedures, literature and authors use terms analytical review, analytics, data analysis, analytical tools.

Analytical review represents a low-cost procedure aimed to increase of audit efficiency [7]. „Analytical procedures are used to compare information against expectations, based on an independent (i.e., unbiased) source and the premise that certain relationships between information can be reasonably expected in the absence of conditions to the contrary.” [8] “Data analysis as used by internal auditors is the process of identifying, gathering, validating, analyzing, and interpreting various forms of data within an organization to further the purpose and mission of internal auditing.” [9] “Data mining and analytics are essential activities which should be used by internal auditors. The purpose of data mining and data analytics is to search for patterns, plausible interrelationships and anomalies, which will help in improving operational efficiency and effectiveness, detection and prevention of fraud, reliable financial reporting and adequate compliance with laws and regulations.” [10]

The fundamental factor of analytical procedure application in internal audit engagements includes the skills and knowledge of obtained results interpretation. By applying information technology, calculations are put on the back burner, and the greatest importance has skills to recognize, choose and develop the way of analyzing available data, and explain obtained results. “Related to analytical skills, an internal auditor should be able to review multiple events or populations of data to perform tests that will determine if audit objectives are effective.” [11]

II. LITERATURE REVIEW

Marks (2009) consider analytical procedures as a possible solution to increase the use of technology where he classifies CAATTs (Computer Assist Audit Tools and Techniques) applications into three categories: audit administration, data analysis also called audit intelligence, and specialized tools [12]. The author points out recommendations of PricewaterhouseCoopers study to include requirement to use data analytics and review of automated reporting as a part of auditing planning into companies’ internal audit methodology. Furthermore, “at minimum, data analytics should include performing limited fraud detection procedures, financial trend analysis; and ratio analysis for relevant investment, productivity, liquidity, activity, leverage, profitability, and coverage ratios. The data needed to perform these types of analyses is often readily available – and can be performed well in advance of fieldwork.” [13]

Koskivaara (2007) in her paper studied the ways of integrating analytical procedures into the continuous audit environment [14]. According to the author, analytical procedures are most helpful tool in planning phase where can be used for indicating material error, assessing going concern, indicating management

fraud, assessing internal control risk, forecasting audit budget, and it can impact on reducing detailed test. In testing phase, it can be useful tool for indicating material error, management fraud, and to reduce detailed test.

Moolman (2017) indicates that “analytical procedures remain a useful tool in order to evaluate past and current company performance, predicting business failures, and identifying errors and fraud in financial statements which assists the auditor in decision making. (...) It is therefore suggested that the auditor consider supplementing normal analytical procedures with additional procedures, including Du Pont, EVA, Altman’s Z-score and Benford’s Law. These analytical procedures may flag areas of potential misstatement in the financial statements during the risk assessment process.” [15]

Sparks (2010) emphasizes the role of analytical procedures in fraud detection by internal auditors. “While system and data errors can serve as a breeding ground for fraud and abuse, internal auditors can apply data analysis techniques to identify issues within the organization’s data. Data analysis tools allow the auditor to interrogate large volumes of data, and run multiple queries to look for and extract unknown information, which assists in detecting internal control violations, errors and potential fraud.” [16] Furthermore, Sparks (2010) consider that “data analysis tools help maintain the history of analysis activities to support audit conclusions and ensure the auditing work did not introduce data integrity and reliability issues into the workpapers.” [17]

Bizarro and Garcia (2011) stated that “analytics must be systematically incorporated into the audit mindset and the audit methodology as opposed to ad hoc to be more effective. An understanding of analytics, data analysis, and query software will be essential for the internal auditor of the future. The use of analytics in the audit process results in better audit planning, focus, and recommendations with a further emphasis on output metrics and the business process.” [18]

Glover, Jiambalvo and Kennedy (2000) researched the auditors’ decisions to revise preliminary audit plans in correspondence with the conclusion made by performing analytical procedure where significant unexpected fluctuations are revealed [19]. “In this condition, 56 percent of auditors increase planned tests, which is significantly greater than the percent of auditors who increase planned tests in the other three conditions examined. (...) Similar results are obtained for a continuous dependent variable, change in planned total audit hours.” [20]

Trompeter and Wright (2010) concluded that “while auditors tend to use simple APs, the current study also suggests, as noted, that they gather and consider a broader array of industry and company information than in the past, particularly nonfinancial information that is widely available through the internet and

databases. An important issue for future research is to examine how auditors integrate such information (e.g., in an informal, unstructured manner) and whether structured tools can provide assistance.” [21]

Kopotienko (2015). emphasized that “domestic and foreign scientists stress the need of applying analytical procedures at all stages of the audit, since they make it possible to detect unusual fluctuations and potential areas of risk, to get reliable and credible audit evidence, analyze received audit reports.” [22] “Analytical procedures, especially automated modern software allow you to not only get a significant portion of the required auditor information to form his competent opinions on reporting, but also to improve the quality of the audit.” [23]

III. LEGAL FRAMEWORK OF ESTABLISHING THE INTERNAL AUDIT FUNCTION IN CROATIAN ENTITIES

The internal control system and internal audit activity for public sector entities in Croatia are regulated by the Public Internal Control Act (Official Gazette Number 78/2015). The Act defines “methodology, standards, relationships and responsibilities, and competence of the Ministry of Finance and other bodies in the implementation of the public internal financial controls system” [24]. According to the Act provisions, the Public Internal Control System comprises internal audit activity and financial management and control [25]. The Rulebook determines which budget users are obliged to establish an internal audit function [26]. Regarding public corporations, the Ministry of Finance discloses annual financial reports for 55 corporations of which 8 of them are financial public corporations and 47 of them are non-financial public corporations [27]. The non-financial public corporations’ representatives are national utilities, energy, transportation service providers, and others. Within the private sector, the internal audit activity is regulated for companies in the financial sector that includes credit institutions [28], investment [29] and pensions [30] funds, leasing [31] and factoring [32] companies, and insurance and reinsurance companies [33].

IV. HYPOTHESIS DEVELOPMENT, METHODOLOGY AND RESULTS

The survey was conducted in the period from October 2017 to December 2017. All questions were closed type where examinees were able to choose one or several suggested answers. In Croatia 265 entities are obliged to establish the internal audit function. Next to them, there are 10 entities, within the public sector, that established function voluntary, which leads us to the number of total 275 internal audit units. The questionnaire was sent via e-mail to 251 internal

auditors. Of total sent invitations, 155 examinees completed the survey (response rate of 61,75%). More than half entities covered by the research employ more than 200 employees, and only 11,6% of entities employs less than 50 employees. Opposed to the conclusion that a majority of analyzed entities are large one, almost 70% of internal audit departments have 1-2 internal auditors, and only 4% of departments employs more than 10 internal auditors. Over 50% of examinees included in the research are chief audit executives (CAE).

In the context of using advanced analytical procedures in the internal audit process, the level of IT development and its availability represent an inevitable factor. Considering that, obtained results show that 57 internal auditors or 36,8% base their activities on non-computer techniques, and use only basic computer application (text processing and calculating). On the other side, 45% of internal auditors have implemented a Computer Assisted Audit Tools and Techniques (CAATs) and use it in few or all phases of the internal audit process.

Considering the previously mentioned result that over 50% of examinees are chief audit executives (CAE) it is not unusual that the majority of examinees are included in all four phases of assurance engagements of the internal audit process. Over 90% of examinees are included in planning and follow-up, and around 88% of examinees are included in performing and reporting phases of the assurance engagements.

The research problem is introduced as a result that there exist significant differences between profit- and public-sector entities in terms of legislation, responsibilities, objectives, applied accounting principles and standards, and finally, as a result of that, financial reporting.

Profit-sector entities consist mostly of companies (35), banks (14), and insurance companies (13). All of those entities are profit-oriented. Although there are differences in financial reporting, all of them applies accrual basis of accounting regulated by Accounting law (Official Gazette Number 78/2015, 134/2015, 120/2016), and correspondingly, International Financial Reporting Standards. On the other size, public-sector is mostly represented by budgetary and extra budgetary users, as ministries (13), counties (15), cities (22), and others. These entities are subject to modified accounting basis regulated by the Rulebook on budgetary accounting and the chart of accounts (Official Gazette Number 124/2014, 115/2015, 87/2016, 3/2018). It is important to emphasize that almost all 155 entities included in the research are obliged to establish the internal audit function, what is regulated by diverse regulations, depending on the entity, as it was stated earlier. Nevertheless, the internal audit activity of all entities is based on the International Professional Practices Framework (IPPF) published by the Institute of Internal Auditor

(The IIA Global). Considering all that facts, few research questions emerged: is there significant differences in operations of two groups of entities, does those two groups of entities apply the same

methodology and have the same practice regarding assurance engagements of the internal audit process, and finally, is there differences in the level of using analytical procedures during those engagements.

Profit-sector entity	Public-sector entity
AIF management companies (1); Banks (14); Factoring companies (2); Housing savings banks (1); Insurance companies (13); Leasing companies (4); Mandatory pension companies (2); Companies (35)	Banks (1); Cities (22); Counties (15); Extra-budgetary users (3); Health institutions (9); Ministries (13); Other state entities (8); State offices (5); Universities (7)
72	83

Table 1: Types of entities and numbers of internal auditors included in the survey

The main purpose of the paper is to determine, which of all those factors have the greatest influence on determining internal audit engagements. Are the internal auditors more influenced by entities specificities, or they are focused on the global internal auditing practices and its framework? Those research questions resulted with the research hypothesis: there is no statistically significant difference in the extent of using analytical procedures in internal audit assurance engagement between profit-sector and public-sector entities in Croatia. The aim of the research hypothesis is to confirm that internal auditors have the same, independent, approach to the assurance engagement, regardless the type of entity they are employed in.

The results are based on the answers of 155 internal auditors of which 72 are employed in profit-sector entities, and 83 are employed in public-sector entities (Table 1).

The assurance engagements represent the most important activity of internal auditors in all types of

entities. The process of assurance engagements usually includes four typical phases: planning, performing, reporting and follow-up. Every phase incorporates certain audit procedures and activities. In accordance with the International Professional Practices Framework (IPPF) analytical procedures are encouraged to be used in every phase of the assurance engagements.

The results of the conducted research show that majority of internal auditors included in the survey is using analytical procedures in all phases (Table 2). The highest proportion of using analytical procedures can be noticed in performing phase and the lowest during the follow-up. By observing the type of the entity, differences in proportion can be noticed, but the question is, are those differences statistically significant. Furthermore, the interesting is the fact that in all phases higher proportion of using is in public-sector entities.

		Profit-sector entity	Public-sector entity	Total
PLANNING				
Yes	Count	48	65	113
	%	66.7%	78.3%	72.9%
No	Count	24	18	42
	%	33.3%	21.7%	27.1%
PERFORMING				
Yes	Count	56	78	134
	%	77.8%	94.0%	86.5%
No	Count	16	5	21
	%	22.2%	6.0%	13.5%
REPORTING				
Yes	Count	34	49	83
	%	47.2%	59.0%	53.5%
No	Count	38	34	72
	%	52.8%	41.0%	46.5%
FOLLOW-UP				
Yes	Count	36	45	81
	%	50.0%	54.2%	52.3%
No	Count	36	38	74
	%	50.0%	45.8%	47.7%
Total	Count	72	83	155
	%	100.0%	100.0%	100.0%

Table 2: Results of the research

A higher proportion of internal auditors in public sector entities (78.3%) compared to internal auditors from profit-sector entities (66.7%) are using analytical procedures in planning of assurance engagements. The results are even better for the performing phase where 94% of internal auditors from public-sector compared to 78% of internal auditors from profit-sector are using analytical procedures. The first issue for discussion is the reason of a higher proportion of internal auditors in public-sector entities that use analytical procedures compared to the auditors in profit-sector entity. The next issue is why are analytical procedures more used in performing phase compared to planning engagement, if we take into account significant potential of analytical procedures as an excellent tool for detecting problematic areas during planning processes.

The level of using analytical procedures in assurance engagements for both groups of entities falls as the audit process progresses. During the reporting phase, analytical procedures are used by a bit less than 50% of internal auditors from the private-sector, and 59% of internal auditor from the public-sector entities.

Results for the follow-up are similar as the results of reporting phase. It is significant to notice, that in the follow-up phase the analytical procedures are more used by internal auditors in public-sector that by internal auditors from the profit-sector, but the range between those two groups is the lowest. Furthermore, it can be seen that using the procedures in follow-up is even higher than in reporting phase within profit-sector entities. Opposed to that, using analytical procedures during follow-up by internal auditors in public-sector entities is the lowest of all other observations. That may lead us to the conclusion, that internal auditors in the public sector-entities give less attention to follow-up phase and procedures related to that phase compared to internal auditors in profit-sector entities. Considering that we may conclude that in profit-sector entities exists a greater

awareness of the importance of making sure that recommendations that are results of assurance engagements are implemented, and that the engagements are not carried out only as an obligation. A both variables included in the research are categorical, where type of the entity is nominal variable, and an application of analytical procedures is dichotomous variable (yes/no). Considering that, the most appropriate test to use was Chi-square. The number of valid cases included in the testing is 155. The null hypothesis assumes that there is no association between the application and the type of the entity, or in other words, it can be said that the application is independent compare to the type of the entity. The only prerequisite assumption to use the test is that expected count for every observation is greater than five, and that is achieved for every observation (a 0 cells (0.0%) have expected count less than 5). In internal audit planning phase the minimum expected count is 19.51, in performing phase the minimum is 9.75, reporting phase have a minimum of 33.45, and follow-up 34.37. To test the size of the effect we used symmetric measure Phi because both observed variables have two groups, and considering that, the results are based on the 2x2 table. Similar as correlation coefficients, Phi measures the degree of association between observed variables.

The obtained results show that, at a significance level of 5%, only in performing phase association is statistically significant because the empirical p-value of .003 is lower than theoretical of .050, which leads to the rejection of the null hypothesis, and accepting alternative one (Table 3). It can be concluded that in performing phase of assurance engagements exist significant association between the type of entity and application of analytical procedures, or the application is not independent compare to the type of the entity. The result of the symmetric measure Phi shows us strong positive association (.236) [34].

	Pearson Chi-Square			Symmetric Measure: Phi	
	Value	df	Asymp. Sig. (2-sided)	Value	Approx. Sig.
Planning	2.647a	1	.104	.131	.104
Performing	8.637a	1	.003	.236	.003
Reporting	2.163a	1	.141	.118	.141
Follow-up	.275a	1	.600	.042	.600

Table 3: Results of the Chi-Square and Phi test

Results for the other phases of assurance engagements show that null hypotheses may be accepted because the empirical p-values are higher than theoretical .050. By accepting the null hypotheses for planning, reporting and follow-up we can conclude that there is no association between the application and the type of the entity, or in other words, it can be said that the application is independent compare to the type of the

entity. The overall conclusion is that internal auditors in profit-sector and public-sector entities are using analytical procedures in the similar extent regarding planning, reporting and follow-up phases of assurance engagements. On the other side, there exist statistically significant different in the extent of using analytical procedures in performing phase. Regarding performing phase of assurance engagements, it can be

concluded that 94% of internal auditors in public-sector entities are using analytical procedures, compared to 78% of internal auditor from profit-sector entities. Along with that, it is interesting to notice that for both types of the entity, analytical procedures are most used, just in, performing phase. The level of using analytical procedures is the lowest in follow-up (public-sector entities 54%; profit-sector entities 50%). The research hypothesis that there is no statistically significant difference in the extent of using analytical procedures in internal audit assurance engagement between profit-sector and public-sector entities in Croatia can be only partly accepted with great caution, because the found difference in one of four observed phases. The assumption that internal auditors have the same, independent of the sector, approach to the assurance engagement, regardless the type of entity they are employed in, can be accepted.

CONCLUSIONS

The internal audit activity represents an important mechanism of overall corporate governance. As its main activity, internal auditors perform assurance engagements that are usually carried out within four phases: planning, performing, reporting and follow-up. The literature and practice encourages using diverse analytical procedures, from the simple to advance one, in all phases of assurance engagements. The conducted research includes investigating the extent of using analytical procedures in different phases of assurance engagements by Croatian internal auditors in profit- and public-sector entities. Analyzed data is obtained by conducted survey among internal auditors during the last quartile of the 2017. The results include 155 internal auditors from Croatia. The examinees were questioned if they use analytical procedures in different phases of assurance engagements. The obtained results show that only in performing phase of assurance engagements association is statistically significant. The research hypothesis that there is no statistically significant difference in the extent of using analytical procedures in internal audit assurance engagement between profit-sector and public-sector entities in Croatia can be only partly accepted because the found difference in one of four observed phases. The most important conclusion that can be drawn from the results obtained by the research is the fact that the internal auditors in Croatia are willing to use analytical procedures in their engagements as an important instrument for developing recommendations. The intention of using should be further increased in planning, reporting and follow-up. Additionally, perception what internal auditors consider under the term analytical procedures should be argued. For public-sector entities, results of performed engagements, in the sense of given recommendations, effects, conclusions, savings have

to be measurable. That encourages internal auditors to use concrete data, tables, number, in one world, results of analysis as a way of gathering audit evidence, and reporting them. On the other side, in profit-sector entities, in different corporate governance environment, the priority attention is not put on the number, but rather on narrative finding, conclusions and recommendations. The problem that should be investigated in the future is the type of analytical procedures that internal auditors usually use.

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