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An Econometrical Analysis of the Auditing Agricultural Companies´ materiality as an Indicator of Quality

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Abstract

This paper provides interview evidence on audit materiality and the answers to the variables regarding the size of the companies,which is audited and the size of auditing company. Significant findings from the research interviews are provided from Focus-Groups Questionnaires as a Method of Collecting Qualitative Data, in our case 215 CPA(Certified Public Accountants) from IEKA (Authorized Accountant Experts Institute), Albania.

We have designed questionnaires regarding audit judgment based on the materiality; risk assessment, size of the company and the impact that it has in the audit work. Albanian characteristic is that the big companies is audited by Big 4 and other companies by single CPA.

The questionnaires emphasize the Albanian auditor characteristic in professional judgment, that is depended in the size of the society who audited or in the size of auditing society, and this audit work we see the experience versus calculative methods.

Keywords: Materiality; risks; professional judgment.

1. Introduction

The auditor is expected to design and conduct an audit that provides reason-able assurance that material misstatements will be detected. Materiality is a concept that relates to the significance or importance of an item. Auditors and management sometimes have legitimate differences of opinion about the significance or importance of a misstatement. A misstatement is an error, either intentional or unintentional, that exists in a transaction or financial statement account balance. The auditor and management may disagree about whether a misstatement is material. A Leke(Albanian curence) amount that may be sigificant to one person may not be significant to another. Despite these measurement difficulties, the concept of materiality is pervasive and guides the nature and extent of the audit opinion formulation process. Therefore, it is essential to understand materiality in the context of designing and conducting a qualitative audit. There are various definitions of materiality; we highlight several below that capture the essential elements of this concept.[2]

In Concepts Statement No. 2, the Financial Accounting Standards Board (FASB) defines materiality as "the magnitude of an omission or misstatement of accounting information that, in light of surrounding circumstances, makes it probable that the judgment of a reasonable person relying on the information would have been changed or influenced by the omission or misstatement." ISA 320, Materiality in Planning and Performing an Audit, makes the point that auditors' judgments about materiality should be made based on a consideration of the information needs of users as an overall group.

2. Metodology

Materiality is considered as a key concept in the theory and practice of accounting and auditing. It is a significant factor in the planning of the audit procedures, performing the planned audit procedures, evaluating the results of the audit procedures and issuing an audit report [3].

Cases of gray materiality´s area depend on the experience of auditors in determining the opinion on the financial statements. By the way of formulating hypothesis hints that the dependent factor is the way how the materiality of gray area (consequence) is determined and the cause must be the experience of auditor in the exercise of the profession[4].

The figure below illustrates the operationalization scheme of the concepts in variables for the second hypothesis[5]. As it is presented above,

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the concept of materiality of the grey area represents the effect, while the experience of the auditor in exercising of his profession, gender and age, as well as participation in consecutive audits are causes. This behavior can be translated as; experience, gender, age and participation in audits determine technique of materiality in the gray area. The concept of materiality of gray area is measured by dummy variable with two attributes, where 1 is marked withexperience and 0 is marked with substantive tests and tested population growth. Both these attributes are ways to measure the materiality of the gray zone. Its symbol is (matr_gri).

Experience of the auditor is measured by the number of years he has been practicing out his profession with the symbol *(pervj)*, while the age refers to years of auditor´s life with the symbol (*mosh)*. Gender is measured by a dummy variable, where 0 is female and 1is male with the symbol (*gjin)*, while participation in consecutive audits is measured with a ordinal dummy variable, where 1 is the few option, 2 stands for some and 3 is for many, with the symbol (pj_aud).

It is asked to control the hypothesis that connects these variables in such a functional form:

matr_gri = f (*pervj, gjin, mosh, pj_aud*).

From earlier cases that the hypothesis is: Cases gray area materiality depends on the experience of auditors in determining the opinion on the financial statements[6]. To check this hypothesis naturally arises the need of evaluating the relation of experience with cases auditors materiality gray area through regression[8]. For some models that were evaluated, but in the following table illustrates only two of them.

In both models is dependent variable materialitety technique gray area (mart_gri), which is a dichotomous variable with these attributes: 0 - substantive tests of population growth & test, 1 - experience. The independent variables for the first model are: out annually (variable quantity) and gender (variable categorical: 0 - female, 1 - male), while the second model added variable mosh (variable quantity), representing the age of the auditor. The shape of the equation for the first model could be this:

$$P(matr\_gri_{0;1})=\frac{1}{1+e^{-(\ _0+\ _1 pervj+\ _2 gjin)}},$$

while the second model of mathematical forms may be this:

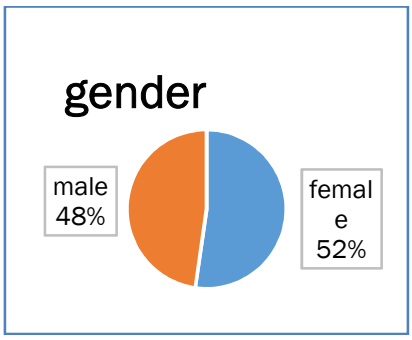
$$P(matr\_gri_{0;1})=\frac{1}{1+e^{-(\ _0+\ _1 pervj+\ _2 mosh+\ _3 gjin)}}.$$

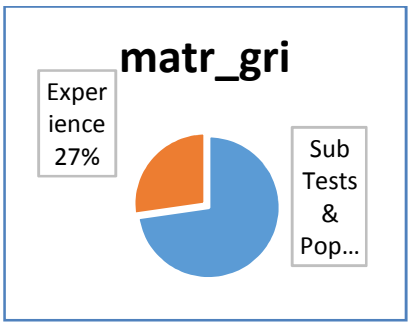
CONCEPTS	Judgement of Materiality	Experience as CPA	Gender	Age	Experience in Auditing
	Consequence ←	*cause* ←	*cause* ←	*cause* ←	*cause*
VARIABLES	Uses experience or substantial tests & the growth of the population being studied	Seniority in the proffession as a CPA	Gender of the CPA	Age of the CPA	Pjesëmarrja në auditime të njëpasnjëshme
	Dependent ←	*Independent* ←	*Independent* ←	*Independent* ←	*independent*
UNITS OF MEASUREMENT	Dummy nominal, 1 – experience; 0 – substancial tests & population growth	Number of the year as a CPA	dummy, 0 – female; 1 – male	Age number	dummy ordinal, 1 – few; 2 – some; 3 – many
SYMBOL	*matr_gri* =	*pervj* +	*gjin* +	*mosh* +	*pj_aud*

Figure 1. The operationalization scheme in variables, their symbols and measurements for the materiality assessment

Graphical presentation of categorical variables

The charts below bring more clearly the nature and composition of the variables. Gender is composed of 48% men and 52% women. We are dealing with a nearly equal distribution: 50 to 50. With regard to the technique used for the matarialitety of gray area, about three quarters of respondents selected the option experience, while slightly more than a quarter have opted substancial tests and growth of the tested population. Specifically, 73% of respondents selected experience option when asked about the technique of determining the materiality of the gray zone, while 27% have chosen the option of testing the substance and the growth of the tested population.





3. Results and Discussion

Cases of materiality of gray area depend on the experience of auditors in determining the opinion on the financial statements[9,10]. To check this hypothesis, naturally arises the need of evaluating the relation of experience with cases auditors materiality gray area through regression. For some models that were evaluated, but in the following table illustrates only two of them.

In both models, the technique of materialitety of the gray area is a dependent variable (mart_gri), which is a dichotomous variable with these attributes: 0 - substantive tests & the tested population growth, 1 - experience. The independent variables for the are: experience (variable quantity) and gender (variable categorical: 0 - female, 1 - male), while the second model added variable mosh (variable quantity), representing the age of the auditor,

If we refer to the hypothesis at the operationalization scheme, noted that participation in audits (pj_aud) is an independent factor, whereas in the preceding regression there is no "traces" of it. Its uninvolvement in the regression relates to assumption of multicolinarity. From descriptive statistics was recorded the high strength of the correlation between *pj_aud* and *pervj*, about 94.2%. A high correlation coefficient between independent variables leads to multicolinarity. So his involvement could lead to distortions of the results. That is why the *pj_aud* factor is not included in the regression. It is apparent that the model is a logistic regression and not a multinominal logistic regression[11], because the dependent variable has two attributes: 0 and 1. The following table provides the main results of the two models estimated by the EViews8 software. In the annex is located more detailed information regarding each step followed to control the hypothesis.

If we focus on model 1, we see the values of independent coefficients associated with the respective probability and relative chance. Thus:

- β0 = -3.4083 is the constant free. His negative sign is distinct, but it should be added that in general this term should not be interpreted, especially in this form. Judging by the probability, we see that this term is significant with 99% confidence level.
- 0.2315 represents β1 coefficient in the above regression. The positive sign shows for the right connection between experience of the auditor and technique of materiality of the gray area (remember the code: 1 - experience). This shows that with the increasing of experience with 1 year, increases the possibility to use the experience as a technique for determining the materiality of the gray zone. So with the increase with a year of experience as auditor, the possibility to use the experience as a technique for the materiality of the gray area is 1.2605 times greater than the use of the technique of test substance and population growth tests, while the other factors remain constant. Judging by probability, this factor is important with 99% level of statistical technique for determining the materiality of the gray zone.

0.2438 coefficient refers to impact factor gender, so β2. Since the signs are positive, then even the relative chance will be greater than 1. Specifically, it can be said that the relative chance of a male auditor that uses the experience in determining the materiality of the gray zone is 1.2761 times larger than females

CPAs. The high probability of this ratio suggests that considerations regarding its findings are to be taken with resources. So we can not speak with statistical certainty.

Table 1. Summary of results from both models for modeling the technique of materiality of the gray area, elaborated with the help of EViews8.

	Model 1 Koeficient	Prob.	Relativ Chance	Model 2 Koeficient	Prob.	Relativ Chance
β_0	-3.4083 (0.6100)	0.0000	0.0331	-6.2312 (1.7146)	0.0003	0.0020
pervj	0.2315 (0.0467)	0.0000	1.2605	0.2055 (0.0492)	0.0000	1.2282
mosh				0.0606 (0.0326)	0.0634	1.0625
gjin	0.2438 (0.4518)	0.5894	1.2761	0.1704 (0.4591)	0.7105	1.1858
McFadden R-squared	0.2189			0.2421		
Akaike info criterion	0.9609			0.9488		
Hannan-Quinn criter.	0.9875			0.9843		
LR statistic	33.857	0.0000		37.453	0.0000	
Hosmer-Lemeshow Test	18.703	0.0165		9.1250	0.3319	

Note: Dependent variable: *matr_gri*, where 1 – *experience*, 0 –*Sub. tests & population growth*; in breckets is the standart mistake of the corresponding coeficent; Data number 132.

The lower part of the table informs some important statistics for the model. Thus, McFadden R-squared is 0.2189, or 21.89%. This statistic is similar to R-square of ordinary linear models, but does not have the same effect interpretation, due to the fact that the dependent variable is categorical. Akaike and Hannan-Quinn criteria are used for the model selection, so for comparison with other similar models. Theoretically, that model reflecting lower values of these statistics is considered the best model. LR statistics test the base hypothesis that all coefficients, except the free constant, are zero.

It is understood that this statistic has similarities with the F statistic of the linear model. Since its probability is zero, then we say that the independent variables are significant at 99% level of security, therefore the model is good. Recent illustrated statistic is Hosmer-Lemeshow test, which reports on the health of the model as a whole. The idea of this test is to compare the values generated by the model with actual grouped values.

Since its probability value is less than $p < 0.05$, then we say that this model is not good. This test may be sufficient to exclude this model analysis technique for determining the materiality of the gray zone. This is why it is also the second model estimated. The second model, unlike the first, involves an independent variable: the age of the auditor (mosh - continuous quantitative). This added variable brings several changes:

- The value of the free coefficient becomes larger, but does not change the sign and continues to be important for statistical level 99%.
- Coefficient close to factor experience becomes smaller, without any effect on its statistical significance. From the first model to the second, the relative chance fades slightly, with the growth with a year of experience as auditor, the possibility to use the experience as a technique for the materiality of the gray area is 1.2282 times greater than the use of the technique of substancal testsand tested population growth, while the other factors remain constant.
- The coefficient close to factor age is 0.0606. Age factor was not taken into consideration by the first model. This factor is important for determining the materiality of the gray zone with statistical security level around 94%. His positive signs leads to a greater chance that the relative 1. Specifically, with increasing age by one year of the auditor, the possibility to use the experience as a technique for the materiality of the gray area is 1.0625 times greater than the use of technique of the substancal tests and the tested population growth, while the other factors remain constant.
- The effect of sex fades slightly when compared to the first model, but still remains statistically insignificant for determining the materiality of the gray area. McFadden R-squared is 0.2421, or 24.21%, ie around 2.32% higher than at the first model. As it is greater, then the second model is better than the first. Akaike and Hannan-Quinn criteria reflects the smaller values than the first model, suggesting so that the second model is better. LR statistic

continues to be statistically significant for the 99% level of security even for this model. Statistic Hosmer-Lemeshow test is smaller than at the first model. Since its probability value is greater than $p > 0.05$, then we say that this model is good. So, the values generated by the second model are similar to the current grouped (observed) values.

Eviews8 Software enables a descriptive analysis of the variables included in the regression categorized by the dependent variable. Below is a chart that illustrates this analysis. It is divided into two main areas: the average (Mean) and standard deviation (Standard Deviation). In the first column are given the variables included in the model. Note "Dep = 0" means the attribute of the dependent variable when it is 0, while "Dep = 1" means when dependent variable takes the value 1.

We see that the average of the auditors experience is about 8.42 years, where only those who have chosen substantial tests and tested population growth (ie, Dep = 0) for the materiality of the gray area have an average of approximately 6.78 years, while theose who have chosen experience have about 12.78 years. By the same logic are also interpreted the signs for the age variable. Also, even the second area of the table is interpreted by categories of the dependent variable only because it refers to the standard deviation of the respective independent variable, including the constant. This analysis creates a clearer idea regarding the categorization of independent variables according to the attributes of the dependent variable.

Many may wonder if age variable is redundant in the second model. To check for this doubt is assessed the test for excessive variables in the model. The following table reports the results of this test. Since the Likelihood probability ration is almost $p = 0.05$, then with statistical certainty of 94% we can say that the age variable is not excessive for the second model. So, the age factor should not leave the regression. The presence of age in the model is also justified by statistical procedure.

By the same logic, it was controlled for missing or hidden variables for the second model. The following is illustrated the relevant test for size factor. Since the probability of the Likelihood ratio statistic is greater than $p = 0.05$, then it is judged with the security level over 95% because size factor is not hidden for the model. So it is not necessary for such a factor to be added in the regression. In fact, the computer software EViews8 accompanies these two tests with estimates of the two models (Restricted and Unrestricted). Log-likelihood statistic is calculated for each model (in the table marked LogL), on which is calculated the statistics of the simulation report (Likelihoodratio).

Table 2. Descriptive statistics categorized for the explanatory variables for the second model of materiality of the gray area, worked with Eviews8.

Categorical Descriptive Statistics for Explanatory Variables

Variable	Mean Dep=0	Mean Dep=1	Mean All
c	1.000000	1.000000	1.000000
exp	6.781250	12.77778	8.416667
age	47.64583	54.05556	49.39394
Gender	0.447917	0.555556	0.477273
Variable	**Standard Deviation Dep=0**	**Standard Deviation Dep=1**	**Standard Deviation All**
C	0.000000	0.000000	0.000000
Exp	5.205671	3.514144	5.489812
Age	8.467870	6.645920	8.485963
Gender	0.499890	0.503953	0.501386
Observations	96	36	132

Table 3. Test for excessive variables in the second model of materiality of the gray area, worked with Eviews8.

Redundant Variables Test
Equation: EQ02
Specification: *matr_gri c pervj mosh gjin*
Redundant Variables: *mosh*

	Value	df	Probability

Likelihood ratio	3.595915	1	0.0579

LR test summary:

	Value	df
Restricted LogL	-60.41745	129
Unrestricted LogL	-58.61949	128

Table 4. Test for hidden variables in the second model materiality gray area, worked with Eviews8.
Omitted Variables Test
Equation: EQ02
Specification: *matr_gri c pervj mosh gjin*
Omitted Variables: *madh*

	Value	df	Probability
Likelihood ratio	1.161873	1	0.2811

LR test summary:

	Value	df
Restricted LogL	-58.61949	128
Unrestricted LogL	-58.03855	127

Table 5. Table of classification for the second model of the materiality of the gray zone, processed with Eviews8.
Expectation-Prediction Evaluation for Binary Specification
Success cutoff: C = 0.5

	Estimated Equation			Constant Probability		
	Dep=0	Dep=1	Total	Dep=0	Dep=1	Total
P(Dep=1)<=C	79	14	93	96	36	132
P(Dep=1)>C	17	22	39	0	0	0
Total	96	36	132	96	36	132
Correct	79	22	101	96	0	96
% Correct	82.29	61.11	76.52	100.00	0.00	72.73
% Incorrect	17.71	38.89	23.48	0.00	100.00	27.27
Total Gain*	-17.71	61.11	3.79			
Percent Gain**	NA	61.11	13.89			

	Estimated Equation			Constant Probability		
	Dep=0	Dep=1	Total	Dep=0	Dep=1	Total
E(# of Dep=0)	76.62	19.38	96.00	69.82	26.18	96.00
E(# of Dep=1)	19.38	16.62	36.00	26.18	9.82	36.00
Total	96.00	36.00	132.00	96.00	36.00	132.00
Correct	76.62	16.62	93.24	69.82	9.82	79.64
% Correct	79.81	46.17	70.64	72.73	27.27	60.33
% Incorrect	20.19	53.83	29.36	27.27	72.73	39.67
Total Gain*	7.09	18.90	10.31			
Percent Gain**	25.99	25.99	25.99			

*Change in "% Correct" from default (constant probability) specification
**Percent of incorrect (default) prediction corrected by equation

Both tests show that the second model is appropriate and there is no need to add other factors, nor leave factors involved in regression. This can be used as an argument in favor of using the second model in analyzing the problem.

One of the most interesting analysis is logistic models classification of data correctly and incorrectly, based on a specific rule and the calculation of the expected values. Eviews8 program recognizes this table as Expectation-Prediction, which is composed of four

main parts. Each corresponds to a classification contingent expected answers in front of the dependent variable observation.

In the upper-left are classified the observed data as predicted by the probability that may be above or below a certain margin (here it is 0.5). In the upper-right, are classified the observed data based on the probability, the choice of y = 1. "Correct" classification is taken when the predicted probability is less than or equal to the limit value and observation y = 0, or when the predicted probability is greater than the limit value and the observation is y = 1. Specifically, 79 observation records Dep = 0 and 22 observation records Dep = 1 are classified correctly by the model. From the theory of logistic models, the observations y = 1, that are correctly predicted, are known as *the sensitivity*, while the observations y = 0, that are correctly predicted, are known as *the specification*.

Overall, the model correctly predicts 76.52% of observations (82.29% of dep = 0 and 61.11% of Dep = 1 of the observations). Profit in the number of accurately predicted observations, moving from the right side of the table to the left, reports a measure of the predictability of the model. The model improves the prediction of Dep = 1 with 61.11%, but the poor forecast of Dep = 0 (-17.71%). Overall, estimated the model is 3.79% (= 76.52% - 72.73%) better in response prediction than the model on the right. This change represents an improvement of 13.89% over 72.73% of the accurate forecasting model on the right.

The lower part of the table contains the analog predicted results based on the calculations of the expected values. The area below-left, illustrates the numbers of expected observations y = 0 and y = 1 of the choices, while in the bottom-right side, are given the numbers of expected observations y = 0 and y = 1 for a model evaluated only by a constant . Of the 96 records (individually surveyed) with y = 0, the expected number of observations y = 0 in the model estimate is 76.62. Of all 11 observations y = 1, the expected number of observations y = 1 is 16.62. These numbers represent approximately 25.99% (= [70.64% - 60.33%] / 39.67%) improvement against constant probability model.

4. Conclusions

Our application has identified the existence of a strong correlation between the professional judgment and the first years of work in the profession of an auditor. Risks and experience are the methods that Albanian CPAs choose to determine the materiality. The result of the study can have significant implication for IEKA and the Quality Audit Control which takes place once every five years for the experts on the field. For the young experts, it takes place only once every two years. The young experts use professional judgment more than personal judgment.

This connection is obvious, especially in CPA who work in audit firms, who by experience that these firms (Big)[12], who use a protocol to a fierce with regard to audit planning and procedures for calculation of risk and materiality, make a new mentality and CPA Albanian, it should serve not only in training IEKA that but the necessity of drafting a working file model - as most auditors are individuals - and it will ndimoje to work every CPA be subject to a strict protocol under this model file, and will enhance the effectiveness of the auditor's work, giving a priority calculations and tests VS Experience.

Also one thing that is noticed CPA women are a little more careful than CPA men after doing a rotation as experience and tests, this leads to reflect IEKA in quality control to be given a place with great control the CPA men. Obvious that the experts with the young and those who work in society are likely to use the tests assessed at Risk and materiality than experience.

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