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PREDICTION OF AUDIT QUALITY BASED ON FINANCIAL RATIO'S: EMPIRICAL TESTING IN INDONESIA

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Abstract*— The novice researchers in Indonesia itself even sometimes claim that only these maneuvers can measure audit quality when using secondary data. There are many other measurements used by previous researchers This study objective to the prediction of audit quality based on Financial Ratio's with CR, TATO, DER, ROE, and EPS. While audit quality uses an audit fee proxies. The research is a quantitative approach, which includes a sample of 21 firms listed in the Indonesia Stock Exchange, included data observation for the period of 2016-2018. This study applied data panel regression using the selection of estimation panel data technique through Chow tests, Hausman's test, and Lagrange Test. This data analysis was operated using STATA MP/14.00. The study finds that all of the Financial Ratio's proxies have predicted Audit Quality. The findings should be a reference for novice researchers, especially in Indonesia, to use the LNFE proxy to measure audit quality, then as consideration for companies and investors, namely audit fees by looking at financial ratios to build a good audit quality.
Keywords: Audit quality, financial ratio's, audit fee.

I. INTRODUCTION

Research studies that investigated the construct of audit quality model, especially until now, still have a reliable on by academics since De Angelo released this measurement in 1981. The novice researchers in Indonesia itself even sometimes claim that only these measurements can measure audit quality when using secondary data, and when asked, the supervisor even answers this, namely the measurement of audit quality is measured based the Big-4 and Non-Big 4 public accountant categories. Thus, so further research will always become important for re-examine in applied research on the determinant of the quality of audits and their relationships and influence [1].

For example, the audit quality conducted by the auditor is based on the correct attributes of the audit firm structure including audit firm size, audit fee, auditor specialization, auditor tenure, and audit type [2,3,4]. Furthermore, a finding states that the higher audit quality will suggest by the overall audit fee charged by the client's [5]. The reliability of financial statements reporting not only be achieved by hiring Big 4 auditor, in fact, the poor independence enforcement factor mechanisms sometimes interfere with auditors when faced with family ownership and investors even though involve the audit firm is a Big 4 auditor's [6]

Audit quality cannot be separated from a good quality of financial reporting. Investors and stakeholders will always see measurements that are concise or reported in financial reviews. Financial ratios will always exist and are presented so that this output is very important and is considered by investors in making business and investment decisions, especially in Indonesia. Financial ratios have five criteria that will be measured to refer the condition of the firm consist of liquidity, profitability, market value, capital structure, and asset management efficiency. Financial ratios are the most widely used measuring tool in analyzing financial information. Financial ratios can be described as restatements of accounting data in terms of time [7]

This research was background for several reasons, scilicet: (1) financial ratio's is simple and accurate measuring tools; (2) financial ratios are factors that are widely used by researchers in predicting corporate performance, such as firm value, profitability, corporate social responsibility, dividend policy, audit quality and others; (3) prior research still has difficulty in defining and measuring audit quality; and (4) prior research sometimes only used one specific audit quality measurement, especially empirical studies in Indonesia.

II. LITERATURE SURVEY

A. Previous Research

Umaru [3] proposed an impact of audit firms viz. compensation and provision towards financial reporting quality of categorize building material companies in Nigeria. The aftermath suggested that, audit quid pro quo and provision of non-audit services have look up the quality of their financial reporting during the period under review. Hosseinniakani et al. [4] doing to review and encapsulate the different audit quality factors i.e. audit fees, auditor tenure, reputation and itemizing, size, industry expertise and non-audit services. The aftermath suggested that each of the factors while affecting the audit quality directly. DeFond et al. [8] define higher audit quality as the greater assurance of financial reporting quality through the

findings suggest that agency cost incentives are an important driver of client demand for high audit quality. Alareeni [9] investigated the association betwixt audit firm characteristics (e.g. audit fees, client tenure, firm size, and non-audit services) and audit quality. The aftermath suggested that only auditor-client tenure and audit fee which has a positive effect on audit quality. Based on the findings above, the importance of audit fees in determining audit quality and financial reporting.

B. Research Model and Hypothesis

The model is a construction through specific parameters that are measured in terms of structure, form, content, quantity and meaning with all limitations [10]. Furthermore, a model can be understood as something that is small which means to describe reality. The model in research is a mathematical model that shows the relationship between variables that influence each other [11]. This research model is a fairly simple model that only uses one independent variable (X) and one dependent variable (Y).

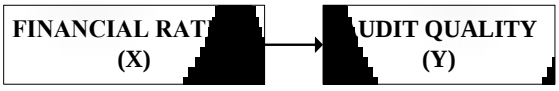

Figure 1: Research Model

Based on the research model above, the research hypothesis is stated as follows:

H0, which is stated by the financial ratio's, has no significant effect in the context of audit quality.

Ha, which is stated by the financial ratio's, has a significant effect in the context of audit quality.

III. PROPOSED METHOD

A. Research Type

It is a quantitative research build to publish data aggregated from the annual and financial reports of the sample firms. The purpose of this research is to examine and identify the X variable, which is the Financial Ratios, the Y variable, which is the Audit Quality.

B. Population and Sampling Technique

The population comprises the firms under the transportation sub-sector listed in the Indonesia Stock Exchange in 2018. The sampling technique uses purposive sampling that is the confidence that the information needed for research will be obtained from one target group based on the criterion which is established by the researchers [11]. The criteria defined include (1) Firms that fall within the in sub-sector of transportation consistently during 2016-2018; (2) The company has complete data and information during the observation period; and (3) The company uses the besides IDR currency as the reporting currency, then it is converted using the BI middle rate. The research includes 21 firms as its sample.

Table 1: Research Sample

Ticker Code	IPO Date	Firm's of Name
	22-Jun-2005	PT Arpeni Pratama Ocean Line Tbk
	12-Nov-2012	PT Adi Sarana Armada Tbk
APOL	08-Jan-2013	Pelayaran Nasional Bina Buana Raya Tbk
ASSA	05-Nov-2014	PT Blue Bird Tbk
BBRM	26-Mar-1990	PT Berlian Laju Tanker Tbk
BIRD	11-Feb-2011	PT Garuda Indonesia (Persero) Tbk
BLTA	15-Dec-1997	PT Humpuss Intermoda Transportasi Tbk
GIAA	17-May-2001	PT Tanah Laut Tbk
HITS	17-May-2001	PT ICTSI Jasa Prima Tbk
INDX	15-Apr-2014	PT Ekasari Lorena Transport Tbk
KARW	16-Apr-2011	PT Mitra Bantera Segara Sejati Tbk
LRNA	30-Jan-1997	PT Mitra International Resources Tbk
MBSS	12-Jul-2011	PT Indo Straits Tbk
MIRA	15-Agus-1994	PT Steady Safe Tbk
PTIS	16-Jun-2016	PT Sillo Maritime Perdana Tbk
SAFE	03-Dec-2014	PT Soechi Lines Tbk
SHIP	02-Nov-2012	PT Express Trasindo Utama Tbk
SOCI	09-Jul-2003	PT Pelayaran Tempuran Emas Tbk
TAXI	20-Feb-2013	PT Trans Power Marine Tbk
TMAS	03-May-2007	PT Weha Transportasi Indonesia Tbk
TPMA	29-Nov-2010	PT Wintemar Offshore Marine Tbk
WEHA		
WINS		

Adopted by: [12]

C. Fill Measurement the Format of Audit Quality and Financial Ratio's

Previous to defining and measuring audit quality, we summarized indicators of audit quality through the following format:

Table 2:Fill Summarize Indicators of Audit Quality

Proxies	Summary of Indicators	Prior Research Name, Years
Audit Fee	Log natural of fee audit (LNFE)	DeAngelo, 1981 Carcello et al., 2002 Bedard et al., 2010 DeFond et al., 2013 DeFond and Zhang, 2014 Sarhan et al., 2019

Adopted by: [1]

Audit quality and financial ratio's variables transcript to the definition and the scale measurement through the following formats:

Table 3:Fill Measurements of Variable

Proxies	Definition	Formulation	Scale
Audit Fee	additional audit effort which led to a higher level of audit quality	LNFE	Ratio
Prior Research: [13,14,15,8,16,17]			

Financial Ratio's	Financial ratio's can be described as restatements of accounting data in terms of time	CR, TATO, DER, ROE, and EPS	Ratio
Prior Research: [3,7]			

Adopted by: [1]

D. Proposed Data Processing: STATA/MP 14

The data analysis method used panel data regression with STATA/ MP 14.00 processing aids. The processing stages are carried out consist of:

1) Panel data regression model selection estimation technique viz. "CEM or FEM using a Chow test, FEM or REM using a Hausman test, and to confirmation the model using a Lagrange method.

2) Classical assumption test using commands: "swilk LNFE CR TATO DER ROE EPS" for normality test, "regress LNFE CR TATO DER ROE EPS " then continued with "estat imtest" for heteroscedastisity test, and "estat vif" for multicollinearity test.

3) Hypothesis testing is used to predict the effect of the two variables, namely independent and dependent variable. These test returns using the commands: "regress LNFE CR TATO DER ROE EPS" to proceed the coefficient of determination and regression for the answer of research hypothesis.

IV. RESULTS AND DISCUSSIONS

A. Statistical Results

The statistical used here is the STATA MP/14.00. Statistical models for solving the problem and have its own advantages using the dta. symbol [18], and also predicted answer tools were constructed using the STATA platform. The initial stage is done by entering data into the SPSS worksheet (Data View), then the measurement specifications are formulated into a variable view and worksheet then Save-As with the file type "Stata Version 8 SE (*.dta)".

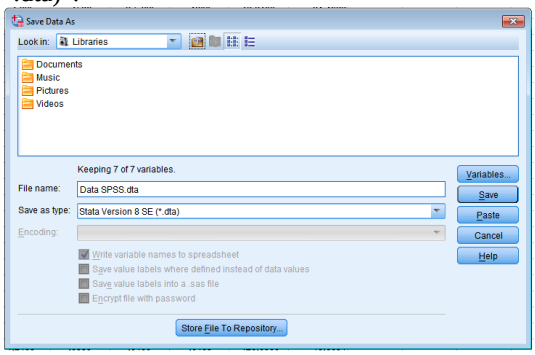

Figure 2: Transform File from SPSS to STATA MP/14 [19]

"tsset ID YEARS" which proceed the following output:

```
. tsset ID YEARS
       panel variable:  ID (strongly balanced)
        time variable:  YEARS, 2016 to 2018
                delta:  1 unit
```

Figure 3: To state the data structure as a time series

1) Create PLS Table

"xtsum LNFE CR TATO DER ROE EPS" which proceed the following output:

```
. xtsum LNFE CR TATO DER ROE EPS

Variable         |      Mean   Std. Dev.       Min        Max    Observations
-----------------+---------------------------------------------+----------------
LNFE     overall |   20.59878   1.554162   17.27793   24.56331   N =        63
         between |              1.380942   18.64382   23.58012   n =        21
         within  |              .7549394   16.34222   22.75004   T =         3
                 |                                               |
CR       overall |  .8370927   1.007554        .01       4.69   N =        63
         between |              .8460339        .01   3.263333   n =        21
         within  |              .5678738  -.599574   3.170426   T =         3
                 |                                               |
TATO     overall |  .3728195   .2662197  -.0020725   1.358635   N =        63
         between |              .2494667   .0025165   1.048057   n =        21
         within  |              .1031835   .0553427   .9554109   T =         3
                 |                                               |
DER      overall | -22.58678   119.9865      -673.77       3.7148   N =        63
         between |              107.6147      -492.23   3.214367   n =        21
         within  |              56.47491   -204.1268   340.4932   T =         3
                 |                                               |
ROE      overall | -.0213921   .2315002      -1.2516       .3384   N =        63
         between |              .1650893  -.5732667   .2099667   n =        21
         within  |              .1649758  -.6997255   .4382745   T =         3
                 |                                               |
EPS      overall | -3.485605   84.96405      -389.81         203   N =        63
         between |              73.46493      -234.94   185.3333   n =        21
         within  |              44.67543   -158.3556   165.8177   T =         3
```

Figure 4: To state the descriptive test results per variable

2) Compute PLS Model

"regress LNFE CR TATO DER ROE EPS" which proceed the following output:

```
. regress LNFE CR TATO DER ROE EPS

      Source |       SS       df       MS              Number of obs =      63
-------------+------------------------------           F(5, 57)      =    4.01
       Model |  38.9714705     5  7.7942941             Prob > F      =  0.0035
    Residual |  110.784498    57  1.94358768            R-squared     =  0.2602
-------------+------------------------------           Adj R-squared =  0.1953
       Total |  149.755968    62  2.41541884            Root MSE      =  1.3941

------------------------------------------------------------------------------
        LNFE |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
          CR |   -.274095   .1794767    -1.53   0.132    -.633491    .085301
        TATO |   1.592712   .7576948     2.10   0.040    .0754545    3.10997
         DER |   .0031583   .0016084     1.96   0.054   -.0000625    .006379
         ROE |   1.723569   .8030872     2.15   0.036    .1154142    3.331723
         EPS |   .0000964   .0022346     0.04   0.966   -.0043784    .0045713
       _cons |   20.34297    .398412    51.06   0.000    19.54517    21.14078
------------------------------------------------------------------------------
```

Figure 5: To state the descriptive test results per variable

3) Compute a CHOWS:

"xtregar LNFE CR TATO DER ROE EPS, fe rhotype(dw) lbi" which proceed the following output:

```
. xtregar LNFE CR TATO DER ROE EPS, fe rhotype(dw) lbi

FE (within) regression with AR(1) disturbances  Number of obs     =        42
Group variable: ID                              Number of groups  =        21

R-sq:                                           Obs per group:
     within  = 0.0785                                         min =         2
     between = 0.2585                                         avg =       2.0
     overall = 0.2024                                         max =         2

                                                F(5,16)           =      0.27
corr(u_i, Xb)  = -0.4521                        Prob > F          =    0.9216

------------------------------------------------------------------------------
        LNFE |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
          CR |   .1110156   .4496197     0.25   0.808    -.8421356    1.064167
        TATO |   4.875773   4.56546     1.07   0.301    -4.802569    14.55412
         DER |   .0001723   .0211192     0.01   0.994    -.0445985    .0449431
         ROE |  -.0397459   1.50211    -0.03   0.979    -3.224077    3.144585
         EPS |   .0013442   .0056267     0.24   0.814     -.010584    .0132723
       _cons |   18.55779   1.537158    12.07   0.000     15.29916    21.81642
-------------+----------------------------------------------------------------
      rho_ar |  .14813831
     sigma_u |  1.2318487
     sigma_e |   1.201013
     rho_fov |   .5126726   (fraction of variance because of u_i)
------------------------------------------------------------------------------
F test that all u_i=0: F(20,16) = 0.91                     Prob > F = 0.5847
modified Bhargava et al. Durbin-Watson = 1.7096083
Baltagi-Wu LBI = 2.4730722
```

Figure 6: To define a CEM or FEM model

Interpretation:

H0 is Acceptable, which significant probability of F is 0.9216 (greater than 0.05), then select the CEM model.

4) Compute a Hausman method:
"xtregar LNFE CR TATO DER ROE EPS, re rhotype(theil) lbi" which proceed the following output:

```
. xtregar LNFE CR TATO DER ROE EPS, re rhotype(theil) lbi

RE GLS regression with AR(1) disturbances       Number of obs     =         63
Group variable: ID                              Number of groups  =         21

R-sq:                                           Obs per group:
     within  = 0.0038                                         min =          3
     between = 0.3903                                         avg =        3.0
     overall = 0.2546                                         max =          3

                                                Wald chi2(6)      =      10.11
corr(u_i, Xb)      = 0 (assumed)                Prob > chi2       =     0.1199

------------------------------------------------------------------------------
        LNFE |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
          CR |  -.1886848   .1862155    -1.01   0.311    -.5536605    .1762909
        TATO |   1.416427    .809034     1.75   0.080    -.1692506    3.002104
         DER |   .0027271   .0018442     1.48   0.139    -.0008875    .0063418
         ROE |   1.076022   .7818095     1.38   0.169    -.4562962    2.608341
         EPS |   .0004289   .0023551     0.18   0.855    -.0041869    .0050448
       _cons |   20.32858   .4317955    47.08   0.000     19.48228    21.17489
-------------+----------------------------------------------------------------
      rho_ar |  -.32618242  (estimated autocorrelation coefficient)
     sigma_u |  .23427079
     sigma_e |  1.1743811
     rho_fov |  .03827109  (fraction of variance due to u_i)
       theta |  .07767934
------------------------------------------------------------------------------
modified Bhargava et al. Durbin-Watson = 1.7096083
Baltagi-Wu LBI = 2.4730722
```

Figure 7: To define a FEM or REM model

Interpretation:

H0 is Acceptable, which significant probability of chi2 is 0.1199 (greater than 0.05), then select the REM model.

5) Compute a Lagrange test:
For final confirmation of selected model between CEM and REM. "xtreg LNFE CR TATO DER ROE EPS, re" and then "xttest0" which proceed the following output:

```
. xttest0

Breusch and Pagan Lagrangian multiplier test for random effects

        LNFE[ID,t] = Xb + u[ID] + e[ID,t]

        Estimated results:
                         |       Var     sd = sqrt(Var)
                 --------+------------------------------
                    LNFE |   2.415419        1.554162
                       e |    .946703        .9729866
                       u |   1.125553        1.060921

        Test:   Var(u) = 0
                                  chibar2(01) =    11.29
                              Prob > chibar2 =   0.0004
```

Figure 8: To define a CEM or REM model

Interpretation:

H0 is Reject, which significant probability of chibar2 is 0.0004 (less than 0.05), then select the REM model.

6) Display a Normality test:
"swilk LNFE CR TATO DER ROE EPS" which proceed the following output:

```
. swilk LNFE CR TATO DER ROE EPS

                    Shapiro-Wilk W test for normal data

    Variable |   Obs        W          V          z       Prob>z
-------------+--------------------------------------------------
        LNFE |    63    0.97098      1.640      1.070    0.14234
          CR |    63    0.72327     15.643      5.944    0.00000
        TATO |    63    0.85984      7.923      4.474    0.00000
         DER |    63    0.20028     45.207      8.238    0.00000
         ROE |    63    0.78326     12.252      5.416    0.00000
         EPS |    63    0.69792     17.076      6.134    0.00000
```

Figure 9: To display a Shapiro Wilk W-test

7) Computer a Multicollinearity test:
"estat vif" which proceed the following output:

```
. estat vif

    Variable |      VIF       1/VIF
-------------+----------------------
        TATO |     1.30    0.770448
         DER |     1.19    0.841719
         EPS |     1.15    0.869609
         ROE |     1.10    0.906952
          CR |     1.04    0.958649
-------------+----------------------
    Mean VIF |     1.16
```

Figure 10: To display a VIF score

Interpretation:

VIF score is 1.16 less than 5, accordingly the regression model is stated to be clear from the multicollinearity problems in each independent variable.

8) Computer a Heteroscedastisity test:
"estat imtest" which proceed the following output:

```
. estat imtest

Cameron & Trivedi's decomposition of IM-test

---------------------------------------------------
              Source |       chi2     df       p
---------------------+-----------------------------
  Heteroskedasticity |      24.44     20    0.2237
            Skewness |       4.54      5    0.4751
            Kurtosis |       1.11      1    0.2911
---------------------+-----------------------------
               Total |      30.09     26    0.2639
---------------------------------------------------
```

Figure 11: To display a specification model et > imtest

Interpretation:

Heteroscedasticity probability of Cameron & Trivedi's decomposition is 0.2327 (greater than 0.05), accordingly the regression model can be stated does not occur heteroscedasticity problems.

9) Because of REM model is chosen, then pull the regression model shown in Figure 7 which proceed as follow:

```
corr(u_i, Xb)      = 0 (assumed)                Prob > chi2       =     0.1199

------------------------------------------------------------------------------
        LNFE |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
          CR |  -.1886848   .1862155    -1.01   0.311    -.5536605    .1762909
        TATO |   1.416427    .809034     1.75   0.080    -.1692506    3.002104
         DER |   .0027271   .0018442     1.48   0.139    -.0008875    .0063418
         ROE |   1.076022   .7818095     1.38   0.169    -.4562962    2.608341
         EPS |   .0004289   .0023551     0.18   0.855    -.0041869    .0050448
       _cons |   20.32858   .4317955    47.08   0.000     19.48228    21.17489
------------------------------------------------------------------------------
```

The result of hypothesis testing from producing each independent variable has a significant probability score is greater than 0.05 and holds the chi2 score also which is greater than 0.05, namely 0.1199, so that Ha is acceptable. This means Financial Ratio's has a significant effect in the context of audit quality.

B. Discussions

The results of the study of the alternatives' hypotheses that are mentioned above are proven to have a significant effect. In other words, this study empirically to predict the audit quality based on the financial ratio's does support previous studies reviewed with higher audit quality as the greater assurance of financial reporting quality, which an important driver of client demand for high audit quality [8]. In the preliminary surveys, in-charge auditor will usually ask for an overview of the financial ratio's to determine the audit plan, the amount of the honorarium and formulate the scope field of work. Thus, the better the financial ratios presented by the client, the auditor will

determine the quality of the audit through an audit fee. The importance of considering in employing their auditors with optimal compensation to produce financial reporting quality [3]. The further factors to measure audit quality issue through firm size, specialization industries, auditor tenure and another audit services [4].

V. CONCLUSION

The conclusions from the results of the research and discussion are Financial Ratio's with CR, TATO, DER, ROE and EPS proxies able to predict audit quality by measuring the natural logarithm of audit fee. This research recommends that, the findings should be a reference for novice researchers, especially in Indonesia, to use the LNFE proxy to measure audit quality, then as consideration for companies and investors, namely audit fees by looking at financial ratios to build a good audit quality.

The present research framework regarding the audit quality can use surrogate measurements such as the audit and client tenure, firm size, restatement, discretionary accruals, going-concern, subsidiaries, solvency, proxies return. Besides that, Big 4 and non-Big 4 proxies can be added with audit fee proxies so that it can improve the findings and results in future studies.

REFERENCES

[1] T. Husain, "Mapping Evolution of Audit Quality Measurement," *European Journal of Business and Management Research*, vol. 5, no. 3, pp. 1-7, May 2020. http://dx.doi.org/10.24018/ejbmr.2020.5.3.304

[2] Ali Abedalqader Al-Thuneibat, Ream Tawfiq Ibrahim Al Issa, and Rana Ahmad Ata Baker, "Do audit tenure and firm size contribute to audit quality?: Empirical evidence from Jordan," *Managerial Auditing Journal*, vol. 26, no. 4, pp. 317-334, April 2011. https://doi.org/10.1108/ 02686901111124648

[3] Dangana Umaru, "Audit Attributes and Financial Reporting Quality of Listed Building Material Firms in Nigeria," Accounting, Zaria - Nigeria, Thesis 2014. http://kubanni.abu.edu.ng/jspui/bitstream/123456789/6242/1/AUDIT%20ATTRIBUTES%20AND%20FINANCIAL%20REPORTING%20QUALITY%20OF%20LISTED%20BUILDING%20MATERIAL%20FIRMS%20IN%20NIGERIA.pdf

[4] Seyed Mahmoud Hosseinniakani, Helena InÁcio, and Rui Mota, "A Review on Audit Quality Factors," *International Journal of Academic Research in Accounting, Finance and Management Sciences*, vol. 4, no. 2, pp. 247-258, April 2014. https://dx.doi.org/ 10.6007/IJARAFMS/v4-i2/861

[5] S. Rajgopal, S. Srinivasan, and X. Zheng, "Measuring Audit Quality," in *Hawaii International Conference on System Sciences 2018*, Honolulu, Agustus 2018, pp. 1-64. http://hdl.handle.net/10125/59284

[6] Ammar Abid, Muhammad Shaique, and Muhammad Anwar ul Haq, "Do Big Four Auditors Always Provide Higher Audit Quality? Evidence from Pakistan," *International Journal of Financial Studies*, vol. 6, no. 2, pp. 1-22, June 2018. https://doi.org/ 10.3390/ijfs6020058

[7] Sheridan Titman, Arthur J. Keown, and John D. Martin, *Financial Management: Principles and Applications*, 12th ed. Boston, USA: Prentice Hall, 2013.

[8] DeFond and J. Zhang, "A review of archival auditing research," *Journal of Accounting and Economics*, vol. 58, no. 2-3, pp. 275-326, November-December 2014, https://doi.org/10.1016/j.jacceco.2014.09.002

[9] Bahaaeddin Alareeni, "The Association between Audit Firm Characteristics and Audit Quality: A Meta-Analysis," pp. 1-21, April 2017. http://dx.doi. org/10.2139/ssrn.2952836

[10] T. Husain, "An Analysis of Modeling Audit Quality Measurement Based on Decision Support Systems (DSS)," *European Journal of Scientific Exploration*, vol. 2, no. 6, pp. 1-9, December 2019. https://www.syniutajournals.com/index.php/EJSE/article/view/128/118

[11] J. Supranto and Nandan Limakrisna, *Petunjuk Praktis Penelitian Ilmiah untuk Menyusun Skripsi, Tesis dan Disertasi*, 5th ed. Bogor: Penerbit Mitra Wahana Media, 2019. https://scholar.google.co.id/scholar?hl=en&as_sdt=0,5&cluster=6211204825328161647

[12] Indonesia Stock Exchange. (2020) IDX. [Online].https://www.idx.co.id/perusahaan-tercatat/laporan-keuangan-dan-tahunan/

[13] Joseph V. Carcello, Dana R. Hermanson, Terry L. Neal, and Richard A. Riley Jr., "Board Characteristics and Audit Fees," *Contemporary Accounting Research*, vol. 19, no. 3, pp. 365–384, 2002. https://doi.org/10.1506/CHWK-GMQ0-MLKE-K03V

[14] Jean C. Bedard, Karla M. Johnstone, and Edward F. Smith, "COMMENTARY: Audit Quality Indicators: A Status Update on Possible Public Disclosures and Insights from Audit Practice," *Current Issues in Auditing*, vol. 4, no. 1, pp. C12–C19, March 2010. https://doi.org/10.2308/ciia.2010.4.1.C12

[15] M. DeFond, D.H. Erkens, and J. Zhang, "Do Client Characteristics Really Drive the Big N Effect? Evidence from Matching Methods," 2013.

[16] Ahmed Sarhan, Collins G. Ntim, and Basil Al-Najjar, "Antecedents of Audit Quality in MENA Countries: The Effect of Firm- and Country-Level Governance Quality," *Journal of International Accounting Auditing and Taxation*, vol. 35, pp. 85-107, Juni 2019. https://doi.org/10.1016/j.intaccaudtax.2019.05.003

[17] L.E. DeAngelo, "Auditor Size and Audit Quality," *Journal of Accounting and Economics*, vol. 3, no. 3, pp. 183-199, December 1981b. http://dx.doi.org/10.1016/0165-4101(81)90002-1

[18] Agus Djoko Santosa, *Analisis Kuantitatif Menggunakan Stata (Cetakan Pertama)*. Yogyakarta: Kepel Press, 2020.

[19] T. Husain and Maulana Ardhiansyah, "Pair-Samples T Test: Simulation Model of Financial Ratio's Measurement with Decision Support Systems (DSS) Approach," *International Journal of Advanced Trends in Engineering, Science and Technology (IJATEST)*, vol. 5, no. 4, pp. 13-17, July 2020.http://www.ijatest.org/wp-ontent/uploads/v5.i4.3.Pair-Samples-T-Test-Simulation-Model-of-Financial-Ratios-Measurement-with-Decision-Support-Sytems-DSS-Approach.pdf