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**PANEL TEST IN FINANCIAL RATIO : CASE STUDY INDONESIA  
TELECOMMUNICATION INDUSTRY**

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**Abstract**

The focus of this study is to look at the relationship between the financial performance of telecommunication companies in Indonesia with the help of the use of company financial ratios such as earning per share ratio (EPS), current asset ratio (CR), return on assets ratio (ROA) and return on equity ration (ROE). 5 companies in the sample analysis made based on 4 models of the company's financial ratios. The financial ratio is calculated from the company's financial statements for 10 consecutive years from 2006-2016, using cointegration and causality test. However, this study uses a separate mapping method as a tool of analysis and specific grouping in describing patterns and movement of relationships between financial ratios of companies in the telecommunications sector, especially in Indonesia. From the studies that have been carried out, there is no cointegration and causal relationships between financial ratios for telecommunications companies in Indonesia.

**Keyword :** Financial ratio, Panel data, Industry telecommunication.

## Introduction

In the studies conducted [1] and [2], for the last few years the use of financial ratio analysis in firms has become a good tool for managers in making more popular decisions and can be considered as a tool for determining normal activities and activities company. The use of financial ratio model, has got many inputs and corrections from some previous research, either from the equation model or in terms of financial ratio model that is in use. By using financial ratio model in company, can make small industry and big industry give picture about its daily operational activity in the form of number which is described. But over time, the process of depiction also makes some criticisms emerging, especially when the company lacks liquidity and needs loans as venture capital. With the picture of financial ratios, can make the banking party to clarify the condition and overall financial position of the company. So what has been created with the financial ratio model, can provide clarification and additional information about the company's financial condition statement financially, and can make a variety of business decisions.

On the other hand the use of the financial ratio model can reduce the uncertainty and provide a reliable assessment related to strategy, planning, investment process, and efficiency in operational activities. But in some literature, the occurrence of a functional relationship with the use of financial ratio model and business analysis make the goal to be achieved to be predictable. Usually the model of financial ratios that are often used is the investment model and model in measuring the level of profitability of the company in the present and in the future. In addition to the financial ratios, the statistical model can be applied to the company's financial prediction process or in assessing the possible level of risk that will be experienced by the company. In [1], [2] and [3] several proposals are proposed to build a model of corporate financial analysis. From their study, doing an analysis among some information related to financial ratios, this is done to measure the level of uncertainty experienced by the company. Using data from the S and P index exchanges, as many as fifteen hundred different types of companies and each of them determines a different set of financial ratios in accordance with the type of company in question. From the amount of research done, the thing (1) they do is to choose fifty-one financial ratio model which will be used as factor analysis. Of the number of ratios, subtract several factors, so the results can be calculated using the maximum variation of data used for financial statement year ending from 1990-2011. This model allows focusing on using the best and most stable ratio during the period of 1990-2000, and from 2001-2011 by limiting the multicollinearity level between the financial ratios in detail. Yang (2) with a perspective of the existing information theory. Using an entropy data analysis model, finding financial ratios will provide more accurate information, related to the degree of financial uncertainty experienced by the company, according to the type of industry group.

Still in [2 & 3] entropy techniques and other techniques used in this study, making calculations of the distribution of numbers in the probability of occurrence, some providing complete information and some incomplete. So in determining the prediction of corporate financial information, there is a ratio that has been selected for each type of industry in the perusal. This study, consisting of 5 stages, stage 1 is the beginning, stage 2 contains literature review, stage 3 is a research method, stage 4 discussion of results and stages of 5 conclusions. This study is conducted to provide suggestions in developing models of financial analysis and disfiction by using a special panel data test at telecommunications companies listed on the BEI during the 10-year financial statements.

## LITERATURE REVIEW

In conducting a study dealing with the use of financial ratios, it usually has several objectives that must be implemented to obtain good and proper financial ratios in making the information generated, both empirically and substantial information that has a firm past relationship with events may not be predictable in the future. Therefore, the prediction model is expected to be useful, so the 3 assumptions in the selection and the proposed financial ratio model look at some provisions such as: firstly, by looking at the level of precision of the chosen and time-based financial ratios, the second, the model proposals and variations of the financial ratios in use and should look at the types and characteristics of the companies that use, the third is expected in getting the model of the financial ratios to be in use, should first be free from internal problems related to redundancy of the use of the results of information itself. But empirically in establishing and defining standards of accuracy in choosing financial ratios based on time and one should use the best-deemed collection of information. The use of multiple variable sets in the study, it is possible to get the results of a range of variable devices in the proposal. See in the study [1 & 2] which investigates the uncertainty of various related and related information to the company, and tries to choose and decide which type and model of financial ratios to use, which is deemed to have and can produce the best information from so many and kinds of industry characteristics. Various models of proposals in the use of financial ratios, it is possible to undertake a development of analytical tools within the company's finances. It is intended that the use of financial analysis or financial ratios is expected to create a set of the most appropriate ratio and can provide more informative information. On the other hand, the use of financial ratios as an analytical tool can be based on a model of entropy analysis in assessing the uncertainty that the firm will face, indirectly providing information on the level of uncertainty facing the company. In [2, 3 & 4] the conclusions can be drawn is to make suggestions and use of analytical tools such as regression modeling is believed to obtain models and tools for forecasting analysis or corporate financial predictions, which can later be used in assessing the predictions and financial condition of the company by using financial ratios. From the overall study explains the use of financial ratios can be believed and can explain intrinsic and extrinsic to the circumstances of the company, and explain what the actual information contained in the company's financial report. The results of some of these studies indicate the existence of different characteristics for each type of company, thus can be drawn the conclusion that the information provided with the use of financial ratios can be made a need related to finance and corporate planning.

The research proposed by [5 & 6] summarizes clearly the changes and reforms taking place in the telecommunications industry in Egypt and several other countries. If you see there is a causal relationship that can not be denied. The change and reform process, empirically and collectively, can make market share competitive and can be explained by the emergence and ending of pressures and competition, thereby making more effective and efficient improvements to the industry being analyzed. But clearly, in this study, it is not a model of analysis, but a clear and clear process of reform that makes the service quality in the telecommunication and service industry better, but productivity and regulators are clearly captured. The conclusion of this study explains that consumers are faced with an inefficient market of telecommunication industry in

the company and workers who make outsiders of the company, as more efficient victims. Studies [7 & 8] still review the telecommunications industry, which is believed to be transformed and experience a camouflage. The telecommunications service industry is at the root of making a massive expansion effort by bringing in large numbers of customers and users, especially in the cellular business. However, in [9] the use of the equation model and the estimation model of a re-regression is done for the telecommunications industry. If viewed in [9] OLS model of annual data panels in use from 2000-2013 to see the occurrence of relationships between item items contained in the balance sheet of the company's financial statements. With the use of capital model, company property and other variables in the telecommunication sector in the USA empirically falsify the existence of total employee relationships that have with item items in the balance sheet that is used as research variables. In contrast to [10] proposing relationships and looking at the correlations of some macroeconomic and investment variables that have been done in the telecommunications sector in countries incorporated in MINT namely Mexico, Indonesia, Nigeria and Turkey. The literature conclusions suggest that a statistical model can be used and used as an analysis tool such as correlation analysis, Tau Kendall, Momentum Correlation to calculate the variables analyzed in the study. There was a very high correlation result in Nigeria of seven per cent and Indonesia at forty per cent.

## RESEARCH METHOD

This study was conducted in June 2017. In this study using variable data Earning Per Share (EPS), Current Ratio (CR), Return On Assets (ROA) and Return On Equity (ROE) on 5 telecommunications companies listed on the BEI : PT Telkom Indonesia Tbk, PT Bakrie Telkom Tbk, PT XL Tbk, PT SMART Tbk and PT Indosat Tbk for the financial statements ending in 2006-2016. In this study we use cointegration panel analysis and causality. Panel data is a combination of time series and cross section data, the panel provides more data and more complete and varied information. Thus a greater degree of freedom will be generated and can increase the precision of the estimates. The panel data is able to accommodate the heterogeneity of unobserved individuals but can affect the outcome of the model (individual heterogeneity). This can not be done by time series or cross section studies so that the results obtained through this study will be biased.

## RESULT AND DISCUSSION

In this study using the Engle-Granger cointegration test (1987) [12] can be performed based on the examination model of a residual value, from a regression equation that is considered false. But this is also done by using several variables. If the value of any variable is grouped, then the value of the proposed regression has residue and should be considered I (0). Whereas if the variables in the study are not cointegrated between each other, then the value of the regression described as the residue will be worth I (1). See Pedroni (1999 and 2004) [13 & 14], and in Kao (1999) [15-17] more explaining on this matter, in terms of equations and within the framework of Engle-Granger, which form a set of panel data tests. In dealing with the problem of Deterministic trends for a panel data analysis, the variable model used as an exogenous regressor must be entered into the regression equation in Step 2. But theoretically for the regression made, first use the individual interception model, if you want to include the effect remain individual. If this is already done, then the use of Lag length in

determining the use of the number of lag for regression stage 2. But in this study the number of lags in use remains 1, while the proposed model of cointegration regression is used using cointegration pedroni model [18-20].

**Table 1 : Result test for cointegration telecommunication industry model**

Pedroni Residual Cointegration Test					
Null Hypothesis: No cointegration					
User-specified lag length: 1					
Alternative hypothesis: common AR coefs. (within-dimension)					
				Weighted	
		<u>Statistic</u>	<u>Prob.</u>	<u>Statistic</u>	<u>Prob.</u>
Panel v-Statistic		-0.762908	0.7772	-0.898251	0.8155
Panel rho-Statistic		1.641163	0.9496	1.476264	0.9301
Panel PP-Statistic		-2.079877	0.0188	-0.709904	0.2389
Panel ADF-Statistic		-2.265767	0.0117	-0.682222	0.2475
Alternative hypothesis: individual AR coefs. (between-dimension)					
		<u>Statistic</u>	<u>Prob.</u>		
Group rho-Statistic		2.335159	0.9902		
Group PP-Statistic		-1.303689	0.0962		
Group ADF-Statistic		-0.067794	0.4730		

**Sourced : Proceed by author with software statistic**

The result of table 1 above shows the conclusion of cointegration analysis from a financial ratio data of telecommunication industry in Indonesia, with test type and null hypothesis model [21-22]. Seen variables are made as exogenous variables there are several options and levels of testing. In the next tavel, Table 2 describes and gives results for the panel cointegration test

statistic with the Pedroni test model, which evaluates the zero values of alternative models whose variables are homogeneous or heterogeneous [23-24]. To solve this problem, the four variables performed by cointegration testing with panel data rejected the null hypothesis of cointegration not on conventional sizes of 0.05, in the sense that none of the variables are carefully coexisted with one another [25-28]. Thus it is concluded that the null hypothesis explains the unintegrated variables with each other. And based on the null hypothesis, the value of all variables that are tested in the statistics ter distribution is not normal. If you look at the test results in Table 1, the value of the variance ratio test results on the right and left sides shows the acceptance value of the null hypothesis of zero cointegration at the 5% and 1% levels. Furthermore, the results of the analysis for table 2 presented below, still using panel conitegration test. There are 2 places on the test result table 2, 4 first test statistic is calculated with anelstatistik dimension "in". If null is rejected, then the variables analyzed cointegrate for all variables.

**Table 2 : Result test for cointegration cross section specific telecommunication industry model**

Cross section specific results					
Phillips-Peron results (non-parametric)					
Cross ID	AR(1)	Variance	HAC	Bandwidth	Obs
TLKM	0.055	454.9340	116.1299	5.00	10
BKR	0.374	672.9538	426.0700	5.00	10
XL	0.109	8230.869	2682.891	9.00	10
SMART	-0.208	163.0633	166.3106	1.00	10
INDO	-0.007	278.0833	254.4439	2.00	10
Augmented Dickey-Fuller results (parametric)					
Cross ID	AR(1)	Variance	Lag	Max lag	Obs
TLKM	-0.354	319.9275	1	--	9
BKR	0.084	604.8765	1	--	9
XL	-0.319	6605.167	1	--	9
SMART	0.285	130.4612	1	--	9
INDO	-0.224	274.5826	1	--	9

**Sourced : Proceed by author with software statistic**

Visible test results for financial ratio variables in telecommunication industry presented in table 2, with 3 statistics of the last test is calculated with the dimension "between" group statistics and individuals. Seen in the result of 2 heterogeneous panel table from Pedroni shows non-zero value and from variable in doing research can be concluded that there is no mutual cointegration and receive H zero at 5% significant level. This shows that the variable financial ratios in 5 companies for the year in doing research are not linked with other financial ratio variables in the perusal. The conclusions in Table 2, the results in table 2 are consistent with the results in Table 1. There is no statistically significant, but when viewed in Table 2 there is a remarkable result, such as the panel version. Statistically and systematically the rho-statistic group of data in doing research has varied results, this can be caused by differences in the relationship between variable financial ratios in 5 companies.

**PANEL CAUSALITY LAGS 1**

Subsequent tests in this study using panel causality model, this test is very different based on the assumptions made about the homogeneity of cross-variable coefficients to be in carefully. The software used describes the 2 most commonly used approaches to test the causality of these panels. 1 that treats panel data as a large data set, then tests the Granger causality in a standard way, with the exception of not allowing data from one cross-section to include the value of data left behind by the next cross and 2 opposite variables. But in this study there is little different that is done, the test of causality in the financial ratios of the company will be able to see the results as presented in table 3 below:

**Table 3 : Result test for causality telecommunication industry model**

Lags: 1			
Null Hypothesis:	Obs	F-Statistic	Prob.
EPS does not Granger Cause CR	50	0.20879	0.6498
CR does not Granger Cause EPS		2.97467	0.0911
ROA does not Granger Cause CR	50	2.95614	0.0921
CR does not Granger Cause ROA		1.07575	0.3050
ROE does not Granger Cause CR	50	0.01742	0.8955
CR does not Granger Cause ROE		0.49099	0.4869
ROA does not Granger Cause EPS	50	0.86626	0.3567
EPS does not Granger Cause ROA		3.80958	0.0569
ROE does not Granger Cause EPS	50	0.08458	0.7725
EPS does not Granger Cause ROE		3.03606	0.0880



ROE does not Granger Cause ROA	50	0.01706	0.8966
ROA does not Granger Cause ROE		0.07680	0.7829

*Sourced : Proceed by author with software statistic*

From the above table 3 results explain the results for the Dumitrescu and Hurlin test in pairs using data from the "financial ratios of 5 telecommunication companies in Indonesia." From the table results clearly indicate that the receiving null is homogeneous, but does not lead in the opposite direction. Granger's causality test results are only valid for the stationary series, but to be careful in cases where  $x_t$  and  $y_t$  may not be stationary for this study (in summary this study does not perform stationary tests, and assumes the data is stationary.) The approach model of Toda and Yamamoto (1995) methods are considered at least one variable in the above regressions not stationary, the traditional approach is no longer valid.

## CONCLUSION

By using panel cointegration and panel causality which has structure for 4 company financial ratios for 5 telecommunication company in Indonesia, the data of financial ratios in checking not coexisting one another, but by using causality test, financial ratio data of 5 telecommunication company in Indonesia there is an inverse and no direct relationship and there are opposites direction. So it can be explained that the financial ratios in telecommunication industry are not mutually cointegrated and some have a causality relationship between the variable financial ratios in doing research.

## Reference

- 1] Sayari, N., et all, (2017) Industry specific financial distress modeling, BRQ Business Research Quarterly, 20, 45---62, <http://dx.doi.org/10.1016/j.brq.2016.03.003>.
- 2] Gunst, R.F., (1983). Regression analysis with multicollinear predictorvariables: definition, detection, and effects. Commun. Stat. Theory Methods 12 (19), 2217-2260.
- 3] Horrigan, J.O., (1968). A short history of financial ratio analysis. Account. Rev. 43 (2), 284---294.
- 4] Easton, D. P., et all, (2013)., Financial Accounting for MBAs. (Cambridge Business Publishers).
- 5] El-Haddad, A. (2017) Welfare gains from utility reforms in Egyptian telecommunications, Utilities Policy 45, 1e26, <http://dx.doi.org/10.1016/j.jup.2016.10.003>.
- 6] Fridson, M. and F. Alvarez, (2011), Financial Statement Analysis, A Practitioner's Guide, edition, 4ed. (John Wiley & Sons, Inc).
- 7] Gupta, S. (2015), Telecommunications at the crossroads in India, IIMB Management Review, 27, 196–208, <http://dx.doi.org/10.1016/j.iimb.2015.06.001>.
- 8] Palepu, K.G. and Healy, P.M. (2013) Business Valuation & Analysis Using Financial Statements: Text and Cases, Fifth edition., South-Western, Cengage Learning.
- 9] Tomakcioglu, K. (2016) Examining the Relationship between the Balance Sheet Accounts of US Biotechnology, Telecommunications and Transportation Sectors, Procedia Economics and Finance 38, 492 – 498, doi: 10.1016/S2212-5671(16)30220-9.

- 10] Robinson, T.R., et all, (2012)., International Financial Statement Analysis, edition, 2ed. (John Wiley & Sons, Inc.)
- 11] Coban, A. et all, (2016), Macroeconomic facts for Telecom Industry in MINT Countries, *Procedia Economics and Finance* 39, 156 – 164, doi: 10.1016/S2212-5671(16)30267-2.
- 12] \_ \_ \_ \_ \_ (2009), *EViews 7 User's Guide II*, Quantitative Micro Software, LLC 4521 Campus Drive, 336, Irvine CA, 92612-2621, ISBN: 978-1-880411-41-4, Printed in the United States of America, [www.eviews.com](http://www.eviews.com).
- 13] Engle, Robert F. and C. W. J. Granger (1987). "Co-integration and Error Correction: Representation, Estimation, and Testing," *Econometrica*, 55, 251–276.
- 14] Pedroni, P. (1999). "Critical Values for Cointegration Tests in Heterogeneous Panels with Multiple Regressors," *Oxford Bulletin of Economics and Statistics*, 61, 653–70.
- 15] Pedroni, P. (2004). "Panel Cointegration; Asymptotic and Finite Sample Properties of Pooled Time Series Tests with an Application to the PPP Hypothesis," *Econometric Theory*, 20, 597–625.
- 16] Kao, Chinwa D. (1999). "Spurious Regression and Residual-Based Tests for Cointegration in Panel Data," *Journal of Econometrics*, 90, 1–44.
- 17] Indrabudiman, Amir. (2017). Descriptive Analysis Stock Price with Zmijewski Bankruptcy Model to Total Assets on Stock Prices. *International Journal of Scientific Research in Science and Technology (IJSRST)* Volume 3 Issue 6 Print ISSN: 2395-6011, Online ISSN: 2395-602X.
- 18] Indrabudiman, Amir. (2017). Does Social and Environmental Disclosure Affect Stock Price? Evidence From Indonesian. *International Journal of Economic Research* Vol. 14, Number 1. ISSN: 0972-9380.
- 19] Indrabudiman, Amir and Septi Handayani, Wuri. (2017). Intellectual Capital and firm value: Evidence From Indonesia. *International Journal of Pure and Applied Mathematics* Volume 117 No. 15 2017, 885-891. ISSN: 1311-8080 (printed); ISSN: 1314-3395 (on-line).
- 20] Indrabudiman, Amir. (2016). Social Enterprise Characteristics and Environmental Disclosures in Annual Reports of Mining Companies of Indonesia. *International Journal of Management, Accounting & Economics*. Vol.2, No.1: 41-56, ISSN: 2412-0642.
- 21] Indrabudiman, Amir. (2015). Relationship Between Consumer Price Index and Producer Price Index in Indonesia with Large model Econometrics. *International journal of Business Quantitative Economics and Applied Management Research* vol. 2, Issue 6, ISSN: 2349-5677.
- 22] Indrabudiman, Amir, Wuri Septi Handayani, Dewi P. Faeni. (2017). Implementation of Importance Performance Analysis Methods as Government Internal Supervisory Apparatus (GISA) Performance Measurements in Indonesian Provinces. *Journal of Advanced Research in Dynamical and Control Systems* Vol. 9, Special issue 16, p530-545. ISSN: 1943-023X.
- 23] Septi Handayani, Wuri (2016). Unit Root and VAR of Macroeconomics Variables On Stock Returns and Deviden S&P. *SSBRN Symposium* , Bali 4-5 August, 2016. Conducting Interdisciplinary Research. ISBN: 978-602-74915-0-2.
- 24] Enas Abdulhay., Mazin Abed Mohammed., Dheyaa Ahmed Ibrahim., N. Arunkumar., V. Venkatraman., Computer Aided Solution for Automatic Segmenting and Measurements of Blood Leucocytes Using Static Microscope Images, *Journal of Medical Systems* (2018), <https://doi.org/10.1007/s10916-018-0912-y>
- 25] Enas Abdulhay, N. Arunkumar, Kumaravelu Narasimhan, Elamaran Vellaippan, V. Venkatraman., Gait and tremor investigation using machine learning techniques for the diagnosis of Parkinson disease, *Future Generation Computer Systems*, <https://doi.org/10.1016/j.future.2018.02.009>

- 26] Abdulhay, E., Elamaran, V., Arunkumar, N., V. Venkatraman., Fault-Tolerant Medical Imaging System with Quintuple Modular Redundancy (QMR) Configurations, *J Ambient Intell Human Comput* (2018), <https://doi.org/10.1007/s12652-018-0748-9>
- 27] Vardhana, M., Arunkumar, N., Abdulhay, E, Gustavo Ramirez-Gonzalez., Convolutional neural network for bio-medical image segmentation with hardware acceleration, *Cognitive Systems Research* 50 (2018): 10-14
- 28] R.Bhavithra, 2A.Nithyasri, 3 S.Pavithra. SECURE RANK ORDERING SEARCH SCHEME ON OUTSOURCED ENCRYPTED CLOUD DATA USING MULTIPLE KEYWORDS *International Journal of Innovations in Scientific and Engineering Research (IJISER)*



