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Mechanism Financial Ratio Relationship in the Banking with IRF and FEVD

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Abstract

This paper aims to test the transmission mechanism and analyze the 6 banking ratios that exist in Indonesia and is listed on the IDX during the period of 2010-2017 financial statements. The analysis method used in this research is granger causality test, IRF and FEVD to see the mechanism of relationship between financial ratios in banking in Indonesia. From the results of data analysis that has been done in explain that based on granger causality test, the variable ratio of banking finance averaged one-way relationship and not two-way. From the results of the IRF image that has been produced, it appears that the variable financial ratios of some are toward and away from the point or the average value of the variable banking financial ratios are in carefully. By using FEVD using table model, it is seen that the variable of banking finance ratios in the bigger is influenced by the variable itself and partly influenced by other financial ratio variables.

Keyword: Financial ratio, banking ratio, IRF, FEVD.

Mecanismo Relación Relación Financiera en la Banca con IRF y FEVD

Resumen

Este documento tiene como objetivo probar el mecanismo de transmisión y analizar las 6 razones bancarias que existen en Indonesia y figura en el IDX durante el período de estados financieros 2010-2017. El método de análisis utilizado en esta investigación es la prueba de causalidad mayor, IRF y FEVD para ver el mecanismo de relación entre las razones financieras en la banca en Indonesia. A partir de los resultados del análisis de datos que se han realizado para explicar que, en base a una prueba de causalidad mayor, la relación variable de las finanzas bancarias promedió una relación unidireccional y no bidireccional. A partir de los resultados de la imagen IRF que se ha producido, parece que las razones financieras variables de algunos están hacia y lejos del punto o el valor promedio de las razones financieras bancarias variables está cuidadosamente. Al usar FEVD usando el modelo de tabla, se ve que la variable de las razones de financiamiento bancario en las más grandes está influenciada por la variable misma y en parte influenciada por otras variables de relación financiera.

Palabra clave: Ratio financiero, ratio bancario, IRF, FEVD.

INTRODUCTION

In a study conducted [1] assessed the health of the banking industry in solid value from the whole, by looking and referring to variables such as the number of depositors, competent employees, stakeholders of interest and economic stability. In a study that has been done by [1] explaining the existence of two models that are widely used in research in the late 70s and late 80s, this model is familiar with the efficiency of models and market models. It is considered to be an evaluation tool and health level analysis tool in the banking industry, and can be used in assessing the financial system and financial performance of banks in general.

In other studies by [2 & 3 & 4] more developed analytical models and methods are not used for the banking industry. In a study they conducted related to the use of profitability analysis and how to assess the health level of the industry, which always evolved and changed foxes from year to year. Some of their studies also explain how the use of more sophisticated analysis, and based on empirical evidence. Analytical models and tools

and methods used in the study are very influential and can be considered a determinant in assessing the financial performance of banks. And one more thing, the use of sophisticated analytical models and methods to assess the financial performance of banks, is often made a heated debate in many literature and academia.

LITERATURE REVIEW

Many studies have assessed how the world and the banking industry, as done by [2,3,5]. Their paper reviews how to assess the impact of the global financial crisis, particularly those related to the banking sector, in MENA countries, Europe and Asia in particular. The paper they produce, some of them judge the main determinants of profitability both banking industry in the perusal. Clearly, the results of their studies found empirically that during the economic and financial crisis of the 90s, the profitability ratios were considered to be a ratio of dimensions that did not appear to function and play a role in times of crisis, while other ratios such as interest income and the ratio has a positive impact and partial negative impact, for economic variables such as GDP has a positive effect in the event of a crisis in the banking industry in the perusal.

For other studies, with slightly different research variables performed [6,7,8,9], they examined how the impact of the quality of political institutions and the financial system, and on the effectiveness of central bank independence in the research nations. They argue that a low inflation rate can be achieved if the central bank can walk independently. In fact, many have done research using inflation variable data to find results. The use of data analysis models such as OLS, correlation and causality are used as tools to assess the variables they examine. However, still estimation procedures are always in use, whether it uses time series data or panel data, so it can produce a model that is considered dynamic and solid. Several data analysis tests such as heteroskedasticities, multicollinearity and linearity in making the determinant factor for the success of further data analysis. The existence of the graduation rate of the test data, impact on the results of the study so as not to cause something that can make heretical. As they do by using a combined data analysis model for a dynamic panel model, it will be able to provide long-term coefficient estimation values. Graduation and test data compatibility with data analysis techniques used will be consistent and make the results of analysis not error, but on the contrary if there is an error in data analysis and data analysis techniques, will be able to cause the estimated estimation results are not effective and solid. Some use of moderate variables and control variables can be used as a tool in

assessing the targeting results of the variables in detail.

See [10 & 11 & 12] other analysis models, also used in assessing the health and financial performance of banks, call it the fuzzy inference mechanism. From the study they did have the main objective is to evaluate the use of multi-objective analysis model, especially with the theme of bank's financial performance. Empirically the results of their study argue that the process of evaluating financial stability in the banking industry can be made into an overview of the semi-structured model of financial index, based on the analysis model they use. The specification of the analysis model using two multi objective evaluation methods, is believed to be able to provide a degree of contention during the study process. They consider the use of the fuzzy model of fuzzy analysis, making it a set of implicative rules and can reflect the relationships between variables being causal.

RESEARCH METHOD

This study was conducted by the authors in June 2018. For data analysis in this study using the causality test and IRF, FEVD model. In addition, this study uses data on the six variables of financial performance ratio of banks in Indonesia, such as BOPO, CAR, LDR, NIM, NPL and ROA for the period of 2010-2017 financial report. The following descriptive analysis for research data.

Table 1 : Result for statistic descriptive

ITEM	BPO	CAR	LDR	NIM	NPL	ROA
Mean	85.81340	17.90265	83.40023	5.365023	1.631814	1.595628
Median	86.68000	16.39000	84.98000	5.190000	1.450000	1.570000
Maximum	173.8000	68.60000	112.5400	16.64000	4.910000	5.420000
Minimum	47.60000	8.020000	36.42000	1.640000	0.000000	-7.580000
Std. Dev.	16.22026	6.214754	12.67965	2.091927	1.184174	1.761945
Skewness	1.510640	3.525161	-0.673547	1.773864	0.740042	-1.597669
Kurtosis	10.64486	25.16679	4.094124	8.865919	2.737930	9.853022
Jarque-Bera	605.3329	4847.116	26.98042	421.0003	20.23981	512.1846
Probability	0.000000	0.000000	0.000001	0.000000	0.000040	0.000000
Sum	18449.88	3849.070	17931.05	1153.480	350.8400	343.0600
Sum Sq. Dev.	56302.73	8265.358	34405.55	936.4978	300.0852	664.3521
Observations	215	215	215	215	215	215

Source : Proceed author with software

The author uses descriptive statistics test because this test is a numerical and graphical procedure in summarizing the data clusters in a clear and understandable way. A numerical approach can be used to calculate the statistical value of a set of data, such as mean and standard deviation. In table 1 above presented the results of statistical tests that provide information about the average and detailed information about the distribution of data. Present values such as skewness, which measure the symmetry of data distribution, are not equal to 0, then the distribution is not symmetric (a

symmetric), and if skewness is 0 it means that the data is normally distributed (symmetric). If kurtosis (tapered), which measures the tangent of the data distribution, is not equal to 0, then the data distribution may be flatter or more pointed than the normal distribution. The value of the kurtosis of the normal distribution is 0. More accurate information can be obtained by using one of the normality tests that is to determine the probability of whether the sample comes from observations of normally distributed populations or not (eg, Kolmogorov-Smirnov test, or Shapiro-Wilks'W test). The median is the value that divides the observation set into two equal parts, 50% of the observations lie below the median and 50% longer lie above the median. The median of n measurement or observation x_1, x_2, \dots, x_n is the observation value located at the center of the data group after the data is sorted. If the number of observations (n) is odd, the median is located right in the middle of the data cluster, whereas if n is even, the median is obtained by means of interpolation ie the mean of the two data in the middle of the data cluster.

RESULT RESEARCH

In the results of this study, the authors will use and present the results of causality test. This causality test is aimed at measuring the strength of the relationships between variables and indicating the direction of the causal relationship of $X \rightarrow Y$ (X causing Y), or $Y \rightarrow X$ (Y causing X) and $X \rightleftarrows Y$ (X causing Y and Y also causing X). Granger causality test is much more meaningful than ordinary correlation test. If the variable y , does not cause another variable, say x , can we then assume that the latter is exogenous? Unfortunately, the answer is indirect. If we talk about weak exogeneities, this may indicate that the granger causality is neither necessary nor sufficient to establish exogeneity. On the other hand, granger causality is needed (but not enough) for powerful exogeneity. That is, the concept of granger causality is useful as a descriptive tool for Gujarati data series time, (2004).

Table 2 : Result for granger cause

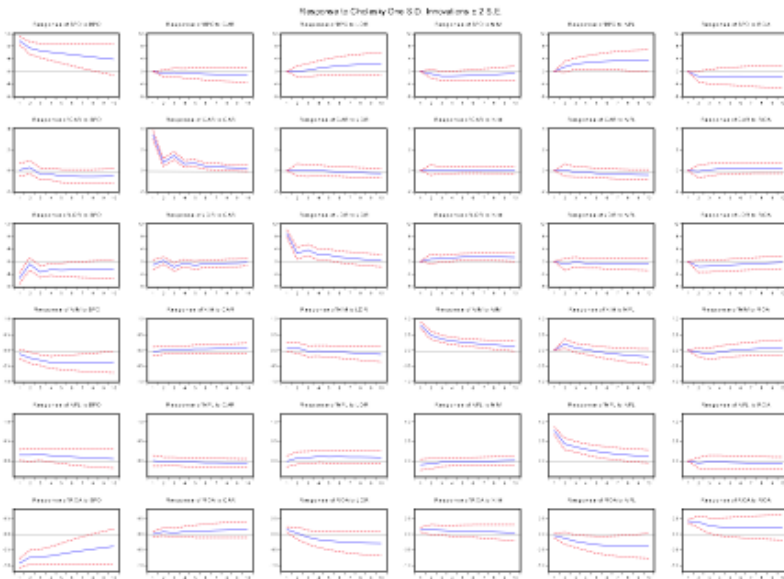
Pairwise Granger Causality Tests			
Lags: 2			
Null Hypothesis:	Obs	F-Statistic	Prob.
CAR does not Granger Cause BPO	129	0.91684	0.4025
BPO does not Granger Cause CAR		2.82163	0.0633
LDR does not Granger Cause BPO	129	0.86460	0.4237
BPO does not Granger Cause LDR		2.04260	0.1340
NIM does not Granger Cause BPO	129	0.65151	0.5230
BPO does not Granger Cause NIM		10.1284	8.0005
NPL does not Granger Cause BPO	129	3.05296	0.0508
BPO does not Granger Cause NPL		1.02566	0.3616
ROA does not Granger Cause BPO	129	2.23479	0.1113
BPO does not Granger Cause ROA		1.71487	0.1842
LDR does not Granger Cause CAR	129	0.21399	0.8077
CAR does not Granger Cause LDR		3.27114	0.0413
NIM does not Granger Cause CAR	129	0.00516	0.9949
CAR does not Granger Cause NIM		1.17923	0.3109
NPL does not Granger Cause CAR	129	0.52063	0.5954
CAR does not Granger Cause NPL		0.13311	0.8755
ROA does not Granger Cause CAR	129	2.71885	0.0699
CAR does not Granger Cause ROA		1.20112	0.3043
NIM does not Granger Cause LDR	129	4.84128	0.0095
LDR does not Granger Cause NIM		0.64143	0.5283
NPL does not Granger Cause LDR	129	0.24199	0.7854
LDR does not Granger Cause NPL		0.46903	0.6267
ROA does not Granger Cause LDR	129	1.54367	0.2177
LDR does not Granger Cause ROA		3.03403	0.0517
NPL does not Granger Cause NIM	129	3.06745	0.0501
NIM does not Granger Cause NPL		0.62224	0.5384
ROA does not Granger Cause NIM	129	7.23107	0.0011
NIM does not Granger Cause ROA		0.23750	0.7890
ROA does not Granger Cause NPL	129	1.35819	0.2609
NPL does not Granger Cause ROA		4.08547	0.0191

Source : Proceed author with software

By using Granger causality test, will be known some things, such as whether the variable X precedes the variable Y, whether the variable Y precedes the variable X, or the relationship of variable X and Y mutual variable ?, and a variable X is said to cause other variables , Y, if the current Y variable is predicted better by using the past values of variable X. The assumption in this test is that the variables X and Y are considered to be a pair of time-dependent data having linear covariance.

Furthermore the authors use IRF and FEVD model test models. According to Sims (1992) explains that the IRF function describes the future K-expression of a prediction error of another variable. Thus, the duration of the influence of the shock of a variable on another variable until its influence is lost or returns to the equilibrium point can be seen or known.

Figure 1 : Impulse Response Function



Source : Proceed author with software

The impulse response image shows the response of a variable due to another variable shock up to some period after the shock. If the Impulse Response (IR) image shows a movement approaching the equilibrium point or returns to a previous equilibrium, the response of a variable due to a longer shock will disappear so that the shock does not leave a permanent influence on the variable. The result of the impulse response function (IRF) for the dual monetary policy transmission flow shows, if the negative trend means that the variable influences the increase of inflation (CPI), whereas if the positive trend means that the variable influences the inflation decrease (CPI).

For the Variance Decomposition test mechanism called Forecast Error Decomposition of Variance is a device in the VAR model that will separate variations from a number of variables that are estimated to be shock components or to Innovation variables, assuming that the innovation variables are not correlated. Then Variance Decomposition will provide information on the proportion of the movement of the effect of shock on a variable to the shock of other variables in the current period and the period to come. Variance decomposition is used to provide information on the proportion of movement of the effect of shock on a. variables against other variables

in the current period and the period to come. We can see in the table below is a table that describes the variance decomposition period January 2011 until December 2014.

Table 3 : Result FEVD for 10 periods

FEVD of BPO:							
Period	S.E.	BPO	CAR	LDR	NIM	NPL	ROA
1	9.888921	100.0000	0.000000	0.000000	0.000000	0.000000	0.000000
2	12.63089	96.49230	0.231028	0.000752	0.336629	1.359015	1.580279
3	14.64697	92.08252	0.218696	0.069439	1.277886	3.817962	2.533495
4	16.31867	88.38667	0.311633	0.439546	1.848380	6.020644	2.993131
5	17.76940	85.03192	0.391053	1.055835	2.156222	8.110781	3.254193
6	19.06156	81.83176	0.524553	1.825358	2.306269	10.03107	3.480991
7	20.20832	78.84695	0.673274	2.656711	2.359132	11.74774	3.716197
8	21.23384	76.07213	0.849584	3.515865	2.343827	13.25873	3.959871
9	22.15032	73.52480	1.037111	4.370020	2.284872	14.57223	4.210966
10	22.97081	71.18998	1.234690	5.200238	2.201072	15.70803	4.465989
FEVD of CAR:							
Period	S.E.	BPO	CAR	LDR	NIM	NPL	ROA
1	3.464707	0.030433	99.96957	0.000000	0.000000	0.000000	0.000000
2	3.565755	0.793133	99.08045	0.037023	0.031073	0.016090	0.042230
3	3.865691	1.443200	98.30540	0.034657	0.026667	0.121794	0.068279
4	3.938233	2.106059	97.33843	0.036645	0.036699	0.238609	0.243560
5	4.045801	3.570992	95.25462	0.057434	0.049371	0.593140	0.474446
6	4.119643	5.121215	92.93910	0.107088	0.066639	1.026723	0.739233
7	4.201314	6.798540	90.25610	0.236524	0.083742	1.624480	1.000610
8	4.276198	8.325090	87.59701	0.424368	0.101109	2.291616	1.260807
9	4.350750	9.674964	84.99924	0.682183	0.115704	3.019229	1.508675
10	4.420882	10.79636	82.58937	0.988006	0.126536	3.754582	1.745148
FEVD of LDR:							
Period	S.E.	BPO	CAR	LDR	NIM	NPL	ROA
1	10.59850	26.41875	1.137923	72.44333	0.000000	0.000000	0.000000
2	11.12968	24.53826	1.095075	71.18214	0.492756	0.636131	2.055640
3	12.44776	26.92833	2.940223	65.56868	0.888353	0.525979	3.148433
4	13.04041	28.43552	2.808947	62.54562	1.632107	0.664314	3.913497
5	13.66549	29.86588	3.396458	59.22250	2.567205	0.723229	4.224724
6	14.12642	31.39197	3.395948	56.44341	3.515374	0.856969	4.396331
7	14.53805	32.79095	3.509269	53.88800	4.390938	0.991791	4.429058
8	14.88872	34.18309	3.463741	51.63626	5.154378	1.178367	4.384164
9	15.20024	35.46273	3.411475	49.64725	5.795617	1.395887	4.287038
10	15.48020	36.65002	3.321109	47.89279	6.310916	1.659452	4.165715
FEVD of NIM:							
Period	S.E.	BPO	CAR	LDR	NIM	NPL	ROA
1	0.825543	1.832385	0.199282	1.302737	96.66560	0.000000	0.000000
2	1.014104	6.783828	0.132307	1.519990	87.03757	4.122463	0.403841
3	1.130362	13.13301	0.141884	1.286691	80.37207	3.817608	1.248743
4	1.232991	20.83039	0.149397	1.101506	73.42258	3.261529	1.234596
5	1.321146	26.81105	0.231372	1.026029	67.93030	2.921327	1.079926
6	1.402886	31.77606	0.298879	1.032701	62.96962	2.944228	0.978513
7	1.480370	35.74723	0.402579	1.162330	58.40011	3.330893	0.956853
8	1.554211	38.82019	0.508829	1.401430	54.25312	4.003927	1.012503
9	1.624745	41.08241	0.634095	1.744090	50.52240	4.882375	1.134638
10	1.691640	42.66274	0.766913	2.169654	47.21097	5.880351	1.309374
FEVD of NPL:							

Period	S.E.	BPO	CAR	LDR	NIM	NPL	ROA
1	0.797847	3.616280	0.012728	0.010133	1.365998	94.99486	0.000000
2	0.929724	5.356075	0.035000	0.688837	1.544378	92.10226	0.273447
3	1.016211	7.188315	0.043528	1.285341	1.380725	89.83104	0.271052
4	1.075485	8.193873	0.125865	2.301403	1.259000	87.83263	0.287227
5	1.117321	8.945056	0.190945	3.064650	1.178311	86.25505	0.365983
6	1.148767	9.344999	0.309899	3.797631	1.119752	84.93555	0.492168
7	1.172673	9.593038	0.420892	4.437978	1.075209	83.82647	0.646409
8	1.191751	9.728703	0.551240	5.023041	1.041530	82.84143	0.814061
9	1.207105	9.792622	0.675437	5.539681	1.019122	81.98587	0.987265
10	1.219745	9.805447	0.799635	5.995812	1.007623	81.23260	1.158880
FEVD of ROA:							
Period	S.E.	BPO	CAR	LDR	NIM	NPL	ROA
1	1.042357	80.34763	0.000236	2.040413	1.876351	0.237649	15.49772
2	1.351821	77.86822	0.295148	1.255143	2.123483	1.091593	17.36642
3	1.580579	77.78401	0.280473	1.305079	2.148463	2.885091	15.59688
4	1.778112	76.63526	0.410503	1.985578	2.034951	4.934419	13.99929
5	1.946809	74.53028	0.529452	2.858170	1.970456	7.149158	12.96248
6	2.094366	72.02106	0.709982	3.816540	1.914311	9.261457	12.27665
7	2.223606	69.48282	0.902593	4.798472	1.844304	11.15194	11.81986
8	2.338042	67.03713	1.119171	5.771595	1.757990	12.80089	11.51323
9	2.439297	64.75282	1.341345	6.704293	1.664079	14.21643	11.32104
10	2.528996	62.64524	1.567585	7.581784	1.570495	15.42177	11.21313
Coolesty : BPO CAR LDR NIM NPL ROA							

Source : Proceed author with software

CONCLUSION

From a study that has been done, has a focus on several banking industry in Indonesia by using the period and basis of financial reporting in 2010-2017. This study seeks to assess and highlight the condition of banks in Indonesia through performance analysis of banking financial ratios that are used as a basis for analysis of research data. The author assumes that the analysis of financial performance ratio of the use of the bank, can be made parameters to measure and represent from the many existing banking performance ratios. This study uses the same of the banking industry and excludes the existing sharia banking industry. From the results of this study reflects the distribution of banks in the enough value homogeneity of the sample research in use. The authors argue that the added value of the research has highlighted the strength and activity of banks in Indonesia, empirically this result can assess the impact of major factors that may arise for the banking industry both in terms of macro and micro.

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