

Multi Criteria Decision Making for Bank Rating Based on Health Level of Bank

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Abstract — The banking industry is vital for the economy of a country. Based on that, the information about the level of health of the banks is required as a reflection of the condition of the bank for all the relevant parties, namely the owners of the bank (the stakeholders) and bank managers, investors, customers, and the Government/central bank as regulator, supervisor of banks that existed in Indonesia. To make it easier for customers and related parties in knowing the best banks in Indonesia, required system rating is assessed based on the level of health. Health assessment of Risk factors measured by bank Profile, Good Governance, Corporate, Earning and Capital (RGEC) and methods of promethee. The purpose of this research is to know the order of ranking of the banks resulting from the method of Promethee Method and RGEC, and to know its accurate results from both methods. The data used are of financial statements in the year 2015, released in 2016 from four banks from the bank group has assets above 30 trillion (BUKU4) and 10 banks from the bank group has assets of 5 trillion to 30 trillion (BUKU3). The ranking results using both of these methods are significantly alike. It is because the value of probability with the Friedman test is 64 for BUKU4 and 108900 for BUKU3, both have greater value equal to the critical value table chi-square with the value of the degrees of freedom (DF) 1 and $\alpha = 5\%$ i.e. 3.84. It shows the order of rank banks based on the level of health of a bank by using Promethee method RGEC and is accurate.

Keywords — *Promethee; RGEC; Health of the bank; Rating; Multi Criteria Decision Making.*

I. INTRODUCTION

Promethee methods included in the technique of multiple-Criteria Decision Making (MCDM)-which has been widely used by scholars and researchers in completing their research problems in decision-making, sorting, and made the rankings [1],[3], [4], [6], and [7]. In this study, Promethee method used to make the ranking of banks in Indonesia based on the health level of the bank. The results of the ranking from promethee method and RGEC method, then analyzed by Friedman test to see existing gap, It is to convince the decision maker with the ranking results used.

The role of banks in advancing the economy of a country is enormous. Almost all sectors of life related to finance, require the services of banks, so the bank can be said as the heart of the economy [2].

Based on Article 1 of the Banking Act No.10 / 1998, banks are defined as business entities that collect funds from the public in the form of savings and channeled to the community in the form of credit and other forms in order to improve the standard of living of many people [5]. The Bank is a financial intermediary institution that in conducting its business activities depends on public funds and trust [10] [20]. This explains that if there is a disruption to the banking sector then it can have a major impact on public confidence, monetary stability and economic growth of the country.

The existence of banks and knowing the health condition of the banking is needed for the government, the community and the bank itself. Bank health is a reflection of the condition and performance of banks as well as supervision of banks by Bank Indonesia. Banks with a healthy predicate will certainly gain greater customer trust than unhealthy

banks [18]. The health assessment of a bank can also be used as a consideration to know the shortcomings or advantages of an aspect in the banking system in order to make improvements in the future [21]. Based on this can be another reason how important to know how the health condition of a company especially for financial institutions.

The regulation of Bank Indonesia No. 1/13/PBI/2011 contains an assessment of the level of health of public bank with the approach of the risk (Risk Based Bank Rating) that includes an assessment of the four factors, i.e. factors Risk Profile (risk profile), Good Governance, Corporate Earning (earning ratios), and Capital (capital) which is hereinafter referred to as the RGEC [17] [19].

The output of the health assessment of banks, in the form of statement of "unhealthy", "less healthy", "Quite healthy", "healthy" and "very healthy", just want to know when a bank is healthy or not, surely that's enough output, but it is not enough and it's hard to know the rank or position of bank health level compared to other banks in Indonesia.

The object of this research are banks in Indonesia, which entered in BUKU3 and 4. List of banks included in BUKU3 is a bank that has a core capital 5 trillion to 30 trillion, there are 10 banks in the BUKU3, and for maintaining the confidentiality of the company then in this research the banks called B001, B002, B003, B004, B005, B006, B007, B008, B009 and B010 [16]. Banks in BUKU4 called with

A001, A002, A003 and A004. 14 the Bank chosen is determined using the method of purposive sampling or sampling was chosen because certain considerations. (Mustafa 2000). Such considerations, namely (1) a public bank (commercial bank), (2) not including Islamic banks, (3) the bank that issued the financial statements for the year 2015. Of the many banks that meet these criteria, taken 14 banks to provide a sample of the object of research. Financial ratio data retrieved from archives of bank Indonesia and the financial services authority with the address www.ojk.go.id. Data downloaded on 1 December 2016.

The financial statements for the year 2015 of the 14 banks analyzed to find out the level of wellness by using approaches me dote RGEC then do the calculations to obtain the results of the perangkingan with the method of promethee. The results of the analysis will then be presented in the form of ratings. Results from both methods are then analyzed again by using the Friedman test.

II. MATERIALS AND METHODS

This type of research is a type of research comparisons or differences. This type of research aims to compare the two research groups, and in the case of this research was to compare the results of the ranking method using Promethee method and RGEC.

Stages Of Research

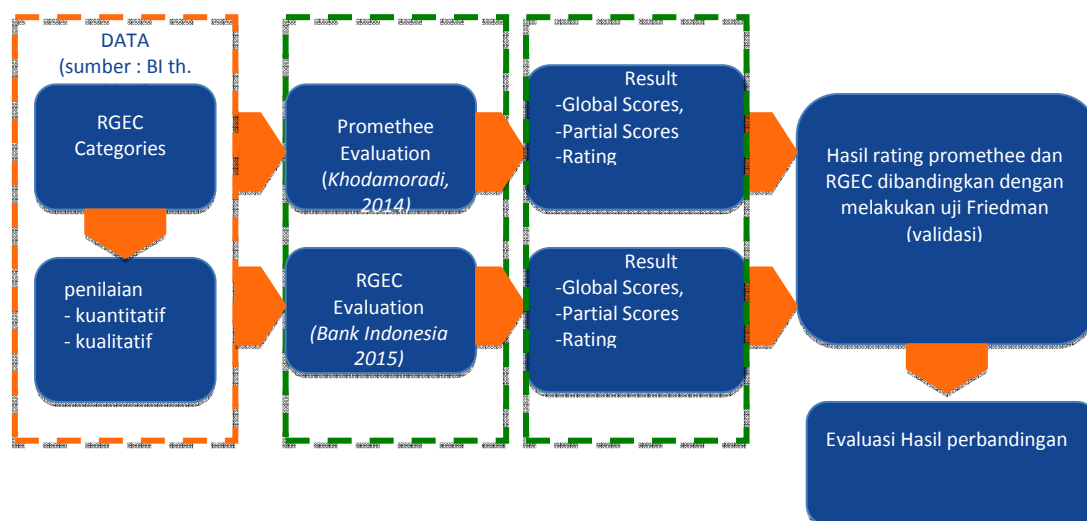


Figure 1. The design stages of research

A method of data analysis in this research is as follows, each of the banks from both groups rated the level of health risk-based (Risk-based Bank Rating). After the data value of a bank's health level is obtained, then do the calculations to obtain the results of the ranking with promethee method and RGEC. The result of the process of ranking by using both of these methods are analyzed using the test statistics "Friedman (Friedman test) to find out the relationship results from the two methods.

III. RESULT AND DISCUSSIONS

A. Calculation with RGEC method

The first step, the classification of a composite rating for each criterion based on the ratio of RGEC. Then 6 criteria calculated according to whether the regulation of Bank Indonesia. Assessment of GCG is the qualitative assessment undertaken by the concerned bank (self-just my assessment) so that these factors are not examined [8]. Each ratio is classified in the appropriate regulations of composite ratings of Bank of Indonesia. The following matrix composite rating assignment criteria to each factor foreign RGEC, source: SE BI number: 6/23/DPNP dated 31 May 2004.

TABLE 1. THE CREDIT RISK COMPONENT RATING MATRIX

Rank	Description	Criteria
1	Very healthy	<2%
2	Healthy	2%–3,5%
3	Quite Healthy	3,5%–5%
4	Less Healthy	5%–8%
5	Unhealthy	>8%

TABLE 2. THE LIQUIDITY COMPONENT RATING MATRIX

Rank	Description	Criteria
1	Very healthy	R.LDR≤75%
2	Healthy	75%<R.LDR≤85%
3	Quite Healthy	85%<R.LDR≤100%
4	Less Healthy	100%<R.LDR≤120%
5	Unhealthy	R.LDR>120%

TABLE 3. ASSETS RETURN OF ASSETS RANKING MATRIX

Rank	Description	Criteria
1	Very healthy	ROA>1,5%
2	Healthy	1,25%<ROA≤1,5%
3	Quite Healthy	0,5%<ROA≤1,25%
4	Less Healthy	0%<ROA≤0,5%
5	Unhealthy	ROA≤0%

TABLE 4. RETURN OF EQUITY RANKING MATRIX

Rank	Description	Criteria
1	Very healthy	ROE>20%
2	Healthy	12,51%≤ROE≤20%
3	Quite Healthy	5,01%≤ROE≤12,5%
4	Less Healthy	0%≤ROE≤5%
5	Unhealthy	ROE<0%

TABLE 5. NET INTEREST MARGIN RANKING MATRIX

Rank	Description	Criteria
1	Very healthy	NIM>5%
2	Healthy	2.01%≤NIM≤5%
3	Quite Healthy	1.51%≤NIM≤2%
4	Less Healthy	0%≤NIM≤1.49%
5	Unhealthy	NIM<0%

TABLE 6. MATRIX CRITERIA FOR RANKING OF CAPITAL FACTOR

Rank	Description	Criteria
1	Very healthy	KPMM>12%
2	Healthy	9%<KPMM≤12%
3	Quite Healthy	8%<KPMM≤9%
4	Less Healthy	6%<KPMM≤8%
5	Unhealthy	KPMM≤6%

Below is the classification stage of the bank's health calculation ratio, for A001 bank code sample, based on the

bank's 2015 financial statements, with the same steps apply to other samples.

TABLE 7. COMPOSITE RATING OF BANK CRITERIA FOR BANK CODE: A001

Criteria	Value ratio	Composite rating
NPL	2.70	2 (Healthy)
LDR	87.8	3 (Quite Healthy)
ROA	2.60	1 (Very healthy)
ROE	17.2	2 (Healthy)
NIM	6.20	1 (Very healthy)
CAR	19.5	1 (Very healthy)

The next step is the determination of the score based on the composite rank for each criterion, the scoring reference can be seen in Table 8. With the following details, the composite rank 1 (very healthy) gives a score of 5, the composite rating 2 (healthy) gives a score of 4, the composite rating 3 (Moderately healthy) was given a score of 3, a composite rating of 4 (less healthy) was given a score of 2, and a composite rating of 5 (unhealthy) was given a score of 1. The final stage is the score for all the summed criteria to determine the composite rating of all the banks that are the object of the study.

TABLE 8. SCORING FOR BANK CODE: A001

Criteria	Value ratio	Composite rating	Score
NPL	2.70	2 (Healthy)	4
LDR	87.8	3 (Quite Healthy)	3
ROA	2.60	1 (Very healthy)	5
ROE	17.2	2 (Healthy)	4
NIM	6.20	1 (Very healthy)	5
CAR	19.5	1 (Very healthy)	5
The Amount Of Score			26

Based on the number of scores obtained for each bank for RGEC ratios, it can be determined bank conditions, according to the composite rank range with the following details, the number of scores 25 to 30 goes into the composite rank 1 with the predicate "very healthy", the score 19 to 24 in. Into the composite rank 2 with the

predicate "healthy", the number of scores 13 to 18 entered into the composite rank 3 with the predicate "healthy enough", the number of scores 07 to 12 entered into the composite rank 4 with the predicate "less healthy", the number of scores 01 to With 06 entered into the composite rank 5 with the predicate "unhealthy". The results of the assessment of the level of health of banks with more RGEC method can be seen in table 9 and table 10.

TABLE 9. THE AMOUNT OF SCORE BUKU4

Bank code	Amount Of Score	Rank	Predicate
A001	26	1	Very healthy
A002	27	1	Very healthy
A003	27	1	Very healthy
A004	29	1	Very healthy

TABLE 10. THE AMOUNT OF SCORE BUKU3

Bank code	Amount Of Score	Rank	Predicate
B001	20	2	Healthy
B002	26	1	Very healthy
B003	23	2	Healthy
B004	20	2	Healthy
B005	24	2	Healthy
B006	21	2	Healthy
B007	25	1	Very healthy
B008	26	1	Very healthy
B009	26	1	Very healthy
B010	27	1	Very healthy

Base on the calculation results obtained bank ranked based on the number of score obtained, the higher score means the better. The order of the rankings obtained are as follows, for banks including book 4: (1) bank code A004 with a score of 29, bank code A002 and A003 has the same score namely 27 ranks with rank (2) and (3), fourth (4) occupied by A001 by a score of 26. For banks that are included in the book 3 obtained the results of the following order: (1) by a score of 27 B010, (2) by a score of 26, B002 (3) B008 with a score of 26, (4) with the score 27 B009, B007 (5) with a score of 25, (6) by a score of 24, B005 (7)

B003 with a score of 23, (8) B006 with a score of 21, B001 (9) by a score of 20, and (9) B004 with score 20.

B. Calculation with Promethee method

Steps analysis of the health of a bank by using the method of promethee are: (a) enter a value NPL ratio, LDR, ROA, ROE, NIM and CAR for any sample bank, (b) calculate the difference between the value of the ratio of NPL, LDR, ROA, ROE, NIM, and CAR against certain criteria interbank, (c) Calculate the function preferences between samples, (d) Calculate the aggregate function preferences, (e) Calculate the value of leaving flow, (f) Calculate the value of entering flow (g) calculate the net value of the flow. From the calculation of the obtained score recap or value criterion consists of the NPL, LDR, ROA, ROE, NIM and CAR for any sample banks are as in the table below [11] [12] [13] [15].

TABLE 11. RECAPITULATION NUMBER OF SCORE BUKU4

Bank code	Score of Criteria						Amount of score
	NPL	LDR	ROA	ROE	NIM	CAR	
A001	4	3	5	4	5	5	26
A002	4	3	5	5	5	5	27
A003	4	3	5	5	5	5	27
A004	5	4	5	5	5	5	29

TABLE 12. RECAPITULATION NUMBER OF SCORE BUKU4

Bank Code	Score of Criteria						Amount of score
	NPL	LDR	ROA	ROE	NIM	CAR	
B001	3	3	2	2	5	5	20
B002	5	3	5	3	5	5	26
B003	4	3	4	3	4	5	23
B004	4	3	2	2	4	5	20
B005	4	2	5	4	4	5	24
B006	3	3	3	3	4	5	21
B007	4	3	4	4	5	5	25
B008	3	4	5	4	5	5	26
B009	4	3	5	4	5	5	26
B010	4	3	5	5	5	5	27

Because the data obtained are already converted to composite ranking so that the resulting value is already normal, then no need for normalizing the data again.

C. Calculate the value of preferences between sample/alternative

At this stage, do a comparison between one sample with another sample for each of the criteria, the Bank as the next sample will be referred to by the term alternative. The comparison of the obtained by way of subtracting the value of the first alternative with the second alternative, then calculated the value of preference in accordance with the type of preference is used [4] [9]. If the results obtained from the difference between both the smaller value equal to zero (0), then the value of the preference of H (d) is zero (0), and if the result value is greater than zero (0), then the value of the preference H (d) is one (1). To compute the functional preferences between sample equations are as follows:

$$P_{ij}(i,i') = R_{ij} - R_{i'j}, \text{ jika } R_{ij} > R_{i'j}$$

$$P_{ij}(i,i') = 0, \text{ jika } R_{ij} < R_{i'j}$$

Description:

R_{ij} = Data sample i , kriteria j

from recapitulation number of score of Bank BUKU3 and BUKU4 functions, calculated preference between samples. For more details of her can be seen in the calculation below, as an example of the calculation below for sample comparison A001 and A002.

Example : $NPL(A001, A002)$

$$d = NPL(A001) - NPL(A002)$$

$$d = 4 - 4$$

$$d = 0$$

$$\text{maka } H(d)=0$$

With the same steps, will be obtained as a function of the value of the preference between samples from all of the criteria.

TABLE 13. THE RESULTS OF THE CALCULATION OF THE VALUE OF THE PREFERENCE BETWEEN THE SAMPLE BUKU4

	NPL	LDR	ROA	ROE	NIM	CAR
A001, A002	0	0	0	0	0	0
A001, A003	0	0	0	0	0	0
A001, A004	0	0	0	0	0	0
...	...	...	...	...	...	...
A004, A003	1	1	0	0	0	0

TABLE 14. THE RESULTS OF THE CALCULATION OF THE VALUE OF THE PREFERENCE BETWEEN THE SAMPLE BUKU3

	NPL	LDR	ROA	ROE	NIM	CAR
B001, B002	0	0	0	0	0	0
B001, B003	0	0	0	0	1	0
B001, B004	0	0	0	0	1	0
...	...	...	...	...	...	...
B010, B009	0	0	0	1	0	0

then the value of the aggregate function preferences obtained from the total value of the function of the preferences of the NPL, LDR, ROA, ROE, NIM and CAR for any sample bank is divided by the number of criteria, in this case the number of criteria is 6 which is composed of the NPL, LDR, ROA, ROE, NIM and CAR. The following is an example of the calculation of the aggregate function value seeking preferences sample comparison A001 and A002.

$$\pi(A001, A002) = (0+0+0+0+0+0)/6 = 0.0000$$

With the same steps, will aggregate value function obtained as a preference between samples from all of the criteria.

TABLE 15. THE RESULTS OF THE CALCULATION OF THE VALUE OF THE AGGREGATE PREFERENCES BETWEEN THE SAMPLE BANK OF BUKU4

	A001	A002	A003	A004
A001		0.0000	0.0000	0.0000
A002	0.1667		0.0000	0.0000
A003	0.1667	0.0000		0.0000
A004	0.5000	0.3333	0.3333	
JMLH	0.8333	0.3333	0.3333	0

D. Count aggregate function preferences

The next stage is to calculate the aggregate function preferences obtained from the sum of weights of the criteria multiplied by the value of the function preferences between samples. as for the formula or equation to be used is as follows:

$$\pi(i, i') = \sum_{j=1}^m w_j \pi P_j(i, i') / \sum_{j=1}^m w_j$$

Description:

P_j = the value of the function preferences

w_j = the weighting of criteria

Following the example of the calculation of the amount of preference functions aggregate weighting the criteria multiplied by the value of the function of preferences, because the same criteria weights for each of the criteria

TABLE 16. THE RESULTS OF THE CALCULATION OF THE VALUE OF THE AGGREGATE PREFERENCES BETWEEN THE SAMPLE BANK OF BUKU4

	B001	B002	B003	B004	B005	B006	B007	B008	B009	B010
B001		0.0000	0.1667	0.1667	0.3333	0.1667	0.0000	0.0000	0.0000	0.0000
B002	0.5000		0.5000	0.6667	0.5000	0.5000	0.3333	0.1667	0.1667	0.1667
B003	0.5000	0.0000		0.3333	0.1667	0.3333	0.0000	0.1667	0.0000	0.0000
B004	0.1667	0.0000	0.0000		0.1667	0.1667	0.0000	0.1667	0.0000	0.0000
B005	0.5000	0.1667	0.3333	0.3333		0.5000	0.1667	0.1667	0.0000	0.0000
B006	0.3333	0.0000	0.0000	0.3333	0.1667		0.0000	0.0000	0.0000	0.0000
B007	0.5000	0.1667	0.3333	0.5000	0.3333	0.6667		0.1667	0.0000	0.0000
B008	0.5000	0.3333	0.6667	0.6667	0.3333	0.6667	0.3333		0.1667	0.1667
B009	0.5000	0.1667	0.5000	0.5000	0.3333	0.6667	0.1667	0.1667		0.0000
B010	0.5000	0.1667	0.5000	0.5000	0.5000	0.6667	0.3333	0.3333	0.1667	
JMLH	4.0000	1.0000	3.0000	4.0000	2.8333	4.3333	1.3333	1.3333	0.5000	0.3333

E. Calculate flow entering and leaving flow

1. Leaving (positive) flow

The value of leaving flow is taken from the results of the calculation of the aggregate function preferences added to each row (horizontal) and then split 3 (as many as the number of samples minus one) for a sample of Book 4, while for the sample book 3 the calculation result of the aggregate function preferences added to each row (horizontal) then divided 9 (as many as the number of sample minus one). The formula or equation to be used is as follows:

$$\varphi^+(i) = \frac{1}{n-1} \sum_{i=1}^n \pi(i, i'),$$

Description :

n = number of samples

The following is an example of the calculation values for the leaving flow sample A001.

$$\begin{aligned} \varphi^+(A001) &= \frac{1}{4-1} \times (0.0000 + 0.0000 + 0.0000) \\ &= 0.0000 \end{aligned}$$

With the same steps, the value obtained will be leaving flow for all samples.

2. Entering (negative) flow

The value of Entering flow is taken from the results of the calculation of the aggregate function for each aggregated preferences columns (vertical) then split 3 (as many as the number of samples minus one) for a sample of Book 4, while for the sample book 3 the calculation result of the aggregate function for each aggregated preferences columns (vertical) then divided 9 (as many as the number of samples minus one). The formula or equation to be used is as follows:

$$\varphi^-(i) = \frac{1}{n-1} \sum_{i=1}^n \pi(i, i'),$$

Description:

n = number of samples

The following is an example of the calculation values for the leaving flow sample A001.

$$\begin{aligned} \varphi^-(A001) &= \frac{1}{3-1} \times (0.1667 + 0.1667 + 0.5000) \\ &= 0.8333 \end{aligned}$$

With the same steps, the value obtained will be leaving flow for all samples.

3. Net outranking flow

The value net value obtained from outranking leaving flow minus flow entering values. The sample with the greatest or highest outranking value will occupy the top position in the rankings.

The formula or equation used in calculating net outranking flow is as follows:

$$\varphi(i) = \varphi^+(i) - \varphi^-(i)$$

Description :

$\varphi^+(i)$ = value of Leaving Flow

$\varphi^-(i)$ = value of Entering Flow

The following is an example of the calculation of values of sample outranking A001

$$\begin{aligned} \varphi(i) &= 0.0000 - 0.2778 \\ &= -0.2778 \end{aligned}$$

With the same steps, the value obtained will be a net outranking flow for all samples.

TABLE 17. THE VALUE OF NET OUTRANKING FLOW SAMPLE BANK OF BUKU4

	Leaving Flow	Entering Flow	Net OutRanging Flow
A001	0.0000	0.2778	-0.2778
A002	0.0556	0.1111	-0.0556
A003	0.0556	0.1111	-0.0556
A004	0.3889	0.0000	0.3889

TABLE 18. THE VALUE OF NET OUTRANKING FLOW SAMPLE BANK OF BUKU3

	Leaving Flow	Entering Flow	Net OutRanging Flow
B001	0.0926	0.4444	-0.3519
B002	0.3889	0.1111	0.2778
B003	0.1667	0.3333	-0.1667
B004	0.0741	0.4444	-0.3704
B005	0.2407	0.3148	-0.0741
B006	0.0926	0.4815	-0.3889

B007	0.2963	0.1481	0.1481
B008	0.4259	0.1481	0.2778
B009	0.3333	0.0556	0.2778
B010	0.4074	0.0370	0.3704

4. Results rank with PROMETHEE method

TABLE 19. RESULTS RANK WITH PROMETHEE METHOD :BANK OF BUKU4

Ranking	Sample	Net OutRangking Flow
1	A004	0.3889
2	A002	-0.0556
3	A003	-0.0556
4	A001	-0.2778

From calculations using Promethee method obtained the order as indicated in table 19 The rank was first occupied by samples or alternative A004 with NetOutRangking value 0.3889, it showed that the best alternative is A004.

TABLE 20. RESULTS RANK WITH PROMETHEE METHOD :BANK OF BUKU3

Ranking	Sample	Net OutRangking Flow
1	B010	0.3704
2	B002	0.2778
3	B008	0.2778
4	B009	0.2778
5	B007	0.1481
6	B005	-0.0741
7	B003	-0.1667
8	B001	-0.3519
9	B004	-0.3704
10	B006	-0.3889

From calculations using Promethee method obtained the order as indicated in table 20. The rank was first occupied by samples or alternative B010 with NetOutRangking value 0.3704, it showed that the best alternative is B010.

5. Friedman Test

Based on both the results of the following rankings can be seen that by using method perangkian RGEC Promethee and had the same results for BUKU4, while for the Bank Group in the BUKU3 there is a difference. Friedman test will be used to analyze patterns of results from both methods.

TABLE 21. RESULTS FROM BOTH METHODS WITH SAMPLE BUKU4

Sample	Method	
	RGEC	Promethee
A001	4	4
A002	2	2
A003	3	3
A004	1	1

TABLE 22. RESULTS FROM BOTH METHODS WITH SAMPLE BUKU3

Sample	Method	
	RGEC	Promethee
B001	8	9
B002	2	2
B003	7	7
B004	9	10
B005	6	6
B006	10	8
B007	5	5
B008	3	3
B009	4	4
B010	1	1

H_0 : ranking of promethee and RGEC method different from each other.

H_1 : ranking of promethee and RGEC method the same

Reject H_0 if $M \geq$ Critical value di $\alpha = 5\%$

$$M = \frac{12}{nk(k+1)} \sum R_j^2 - 3n(k+1)$$

Description:

k = number of columns

n = number of rows

R_j = total ranking of each column

TABLE 23. FRIEDMAN TEST SAMPLE BANK BUKU 4

Sample	Method	
	RGEC	Promethee
A001	4	4
A002	2	2
A003	3	3
A004	1	1
R_j	10	10
R_j^2	100	100
k	2	
n	4	
$\sum R_j^2$	100 + 100 = 200	
$\frac{12}{nk(k+1)}$	$\frac{12}{4 \times 2 \times 3} = 0.5$	
$3n(k+1)$	3 x 4 x 3 = 36	
Friedman test (M)	0.5 x 200 x 36 = 64	

TABLE 24. FRIEDMAN TEST SAMPLE BANK BUKU 4

Sample	Method	
	RGEC	Promethee
B001	8	9
B002	2	2
B003	7	7
B004	9	10
B005	6	6
B006	10	8
B007	5	5
B008	3	3
B009	4	4
B010	1	1
R_j	55	55
R_j^2	3025	3025
k	2	
n	10	
$\sum R_j^2$	3025 + 3025 = 6050	
$\frac{12}{nk(k+1)}$	$\frac{12}{10 \times 2 \times 3} = 0.2$	
$3n(k+1)$	3 x 10 x 3 = 90	
Friedman test (M)	0.2 x 6050 x 90 = 108900	

The value of M compared with the values in the table of chi-square distribution (x 2) and degrees of freedom (df) = k-1. In this study, the value of k = 2, so the value of the degrees of freedom (df) used in the test table of chi-square distribution is 1. Critical value in the table to the value of chi-square degrees of freedom (df) 1 and $\alpha = 5\%$ is 3.84. The value of $M \geq$ critical value, so that H_0 is rejected. The value of M from bank sample BUKU4 = 64. and the value of M sample bank of BUKU3 = 108900, both the M value greater than the value of the critical value ($64 \geq 3.84$ and $108900 \geq 3.84$) So, the conclusion from this study is that the results are ranked by the promethee method and with RGEC method had the same results, meaning the results rankings using RGEC and Promethee is accurate.

IV. CONCLUSION

Based on this study it can be concluded that the ranking of several banks in Indonesia in the Group bank of BUKU3 and BUKU4 in terms of the level of health of a bank by using promethee method and RGEC method generating signifikan the same rank.

With different measures, both those methods are capable of producing nearly the same decisions.

V. RECOMMENDATION

In this study the number of samples that are not much used mainly on the bank group is at BUKU3 so it is still easy to do the calculation manually, but to sample even more advisable to use an application or software that can do the calculation promethee method and RGEC method quickly and accurately.

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