Time Series Analysis of Performance Consistency of Bank Peer Group Model

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Abstract: In order to carry out the responsibility of the bank's business continuity, the board of directors and commissioners of the banks that operating in Indonesia are responsible for maintaining and monitoring the bank's condition and also taking steps to maintain and improve the bank's condition. The bank condition is measured by considering the peer group banks that run in common conditions. I have formulated the model of bank peer group using probabilistic approach of statistics that can be used to analyze the relative position of a bank operating in Indonesia compared to the banks in the peer group. Based on the test results using cross section data from Bank Jasa Jakarta, it was found that the model of bank peer group is the reliable model. It's because the results obtained from it is able to represent the actual conditions. This research was conducted to test the consistency of peer group banks model performance from time series side using quarterly data starting from December 2015 to December 2016. Data sources of the banks taken from The Otoritas Jasa Keuangan (Financial Services Authority, OJK) website. The analysis of time series consistency of peer group banks model performance model is measured by monitoring the stability of Bank Jasa Jakarta performance compared to banks in the peer group, especially to the variables that play an important role in bank sustainability such as NPL (Non-Performing Loan), ROA (Return on Assets) and profit which are the main variables in the banking business. The results of the analysis found that the model of banks peer group tested is a reliable model.

Key words: Peer group model, bank, performance.

1. Introduction

In order to carry out the responsibility of the bank's business continuity, the board of directors and commissioners of the banks that operating in Indonesia are responsible for maintaining and monitoring the bank's condition and also taking steps to maintain and improve the bank's condition [1]-[6].

The Bank's condition rating is the result of the Bank's assessment for their risk and performance [6]. The assessment of bank condition is measured by considering the peer group of banks [2]. Bank's peer group is a group of banks that have common conditions. Banks which incorporated in one peer group tend to have hierarchy, behavior and patterns similarities, although they still have variations among banks. The banks in the peer group are declared as the same class. Bank's peer group generally beused as a benchmark for the progress or deterioration of the condition of banks in their peer group. The average performance of the banks in each peer group can be used as a comparison to the performance of banks in its peer group.

The situation analysis of a bank can be viewed from the relative position of a particular bank compared to the relative positions of other banks in its peer group. Based on the time series data can be observed the

progress of certain bank performance compared to other banks in its peer group from the point of the concerning variable. Besides that, it can be observed whether there has been a change of membership of peer group from a particular bank which also became a predictor of the bank's development and analyzing factors causing it.

Concerning the important role of bank's peer group as a benchmark of objective performance monitoring, the determination of bank's peer group should be done objectively. Up to now, many banks that operating in Indonesia set its peer groups subjectively, so when further traced by the Indonesian banking authorities, the argument of the peer group is not scientifically accountable which indirectly weakens the position of the bank concerned.

I have formulated the model of bank peer group using probabilistic approach of statistics that can be used to analyze the relative position of a bank operating in Indonesia compared to the bank's in the peer group [7]. The peer group model has been tested using cross section data from Bank Jasa Jakarta, as a bank that operating in Indonesia. Based on the test results using cross section data from Bank Jasa Jakarta it was found that the bank peer group model formed is a reliable model which able to represent the actual conditions.

This research was conducted to test the consistency of the bank peer group model performance [7] from time series point of view. For simulating the consistency of bank peer group performance model, in this research will also be used Bank Jasa Jakarta as "anchor" bank by considerating that Bank Jasa Jakarta is a bank with an abundant performance and consistent performance. Starting from 2000 Bank Jasa Jakarta was awarded by Infobank Award 2000 as The Best Bank of 65 Non-Foreign Banks and The second best Bank of 162 Banks in Indonesia until 2016 Bank Jasa Jakarta was awarded by Indonesian Banking Awards 2016 for Best Bank In Financial Aspects category award - Rank I - nonpublic Bank with Category BUKU 1 (Bank with core capital of less than IDR 1 trillion [3]), awarded by Business Indonesia Banking Award 2016 for Most Efficient Bank awards of Bank Category BUKU 2 (Bank with core capital of IDR 1 trillion up to below IDR 5 trillion [3]), awarded by Indonesia Banking Award 2016 for the category of The Most Reliable Bank, The Most Efficient Bank, The Best Bank In Productivity, get Titanium Trophy Infobank Awards 2016, awarded for "Very Good" Performance Bank Award for 19 Years successively. In 2017 Bank Jasa Jakarta consistently maintained its excellence performance by awarding Indonesia Banking Award 2017 for The Most Reliable Bank award category, The Most Efficient Bank, awarded Indonesian Banking Awards 2017 for Best Bank Indonesia award category – nonpublic Bank with Category BUKU 2, awarded Bisnis Indonesia Banking Award 2017 for the category of Most Efficient Bank awards Category Bank BUKU 2, won the Diamond Trophy Infobank Awards 2017 for the category of Bank Performance Award "Excellent" for 20 Years successively.   If the previous research used cross section data in testing the reliability of peer group bank model, then in this research it will be tested by using time series data.

2. Bank Peer Group Model

The plotting of a bank peer group is based on the homogeneity of the bank's condition concerning to the other banks. Besides that, by choosing banks that are classified as peer group it should be noted the suitability of bank's business. The bank peer group model works by assessing the relative performance of bank variables which become a concern to a bank for the other banks through equalization of the bank's core capital [7].

Plotting of bank peer group model is done by using Central tendency and Variation Analysis, Box Plot Analysis, Z value and Scenario analysis. Plotting of bank peer group model taken by Peer Group Simulation in order to obtain peer group which are relevant to the needs of the bank under study. Limitations of banks that conclude as the peer group are based on probability under the normal curve. The formulation of peer

group model is based on a certain confidence interval. By using the area under the normal curve of 90 %, outlier data will appear in banks with Z values greater than + 1.645 or less than -1.645.

Considering that Bank Jasa Jakarta is classified as a bank in the BUKU 2, the members of the peer group shall be selected from the banks belonging to BUKU 2 plus 3 Banks classified as BUKU 1 with core capital close to IDR 1 Trillion.

After the bank peer group formed based on the bank peer group model, then the performance of the bank that became the next concerned; in this case Bank Jasa Jakarta (BJJ) is analyzed based on the variables concern. For example if the variable that become the concern is the Non Performing Loan (NPL) variable as an indicator of bank ability in managing its credit risk, performance analysis of BJJ for Non Performing Loan (NPL) variable is measured by using the formula as follows:

$$\text{NPL performance of Bank Y} = \frac{\text{core capital of } BJJ}{\text{core capital of } Bank\ Y} \times \frac{NPL\ of\ Bank\ Y}{NPL\ of\ BJJ}$$

Based on the results obtained, it is rated to represent the performance of the concern bank compared to other banks in its peer group. Bank that get the best performance for the concern variable will get a rating of 1. With the increasing value of ratings means its performance is getting worse.

3. Research Methods

Analysis of time series consistency of bank peer group model performance will use time series data from bank publication report taken from website of Otoritas Jasa Keuangan (OJK, Financial Services Authority) that is OJK Banking Financial Statement [8]. According to stipulation of the initial peer group based on data derived from 71 banks (Commercial Banks, Foreign Exchange Banks) will be held analysis of observable variables using quarterly data starting from December 2015 to December 2016. For the purposes of time series consistency performance analysis of bank peer group model, will be monitored the performance of the Bank Jasa Jakarta (BJJ) stability compared to banks in the peer group, especially to the variables NPL (Non-Performing Loan), ROA (Return on Assets) and Profit that have important role in bank sustainability.

4. Results and Discussion

The series of peer group models processing for Bank Jasa Jakarta is resulted in the establishment of an initial peer group as listed in Table 1.

Table 1. Series of Peer Group Models Processing for Bank Jasa Jakarta

Number	Bank name	Core capital (million IDR)	Number	Bank name	Core capital (million IDR)
1	Maspion	848006	9	National NOBU	1189658
2	Sahabat Sampoerna	852488	10	BN Parahyangan	1195493
3	Metro Express	1038623	11	Bumi Arta	1233868
4	Ganesha	1057693	12	Index	1242540
5	Mayora	1113178	13	MAS	1268488
6	BOII	1114889	14	Windu (CCBI)	1413732
7	Bank Jasa Jakarta (BJJ)	1152043	15	Capital	1760338
8	SBI Indonesia	1174148			

Based on the banks in the peer group of Bank Jasa Jakarta on the initial peer group plotting, it will be analyzed the performance of NPL, ROA and profit of banks in the peer group.

Non-Performing Loan (NPL), is one of the key indicators to assess whether a bank is performing well or not [9]. NPL is one of the indicators for bank credit risk. High NPL on the bank indicates a problem in the bank that if they do not immediately get a solution would jeopardize the bank's condition. With the higher NPL ratio of banks, the level of bank liquidity against third party funds will be lower. There are many factors that impact the bank NPL that can be classified into three groups, namely the bank internal factors, debtor factors and external factors. Regardless of any factors that cause high NPL, bank's inability to manage their NPL indicates the ability of bank management is not promising [10]. Regarding to NPL variable, the ranking is conclude by using ascending model from small to large. Rank 1 is awarded to a bank with the best NPL performance, which after the capital equity equalization produces the smallest NPL, thereby declaring a low credit default opportunity. In this case, although the core capital of Bank Jasa Jakarta (BJJ) is not the largest among the existing banks in the peer group (Bank Jasa Jakarta's core capital ranks 7th in rank from the smallest core capital to the largest core capital of 15 member banks of peer) but Bank Jasa Jakarta is able to be in the second best position according to the management of NPL in three quarters from June 2016 to December 2016 as shown in Table 2 and Fig 1. NPL of BJJ are far below NPL limitations concluded by Indonesian banking authorities. In accordance to the provisions stipulated by Bank Indonesia, a good bank should keep its NPL below 5 %. Thus Bank Jasa Jakarta is a bank that has excellence ability in managing credit risk. Bank Jasa Jakarta performance achievement in terms of NPL is in line with the acquisition of Titanium Trophy Infobank Awards 2016 for the category of Bank Performance Award "Very Good" for 19 Years successively. In 2017 Bank Jasa Jakarta remains consistent in maintaining its excellence performance by awarding Indonesia Banking Award 2017 for The Most Reliable Bank award category.

Table 2. NPL Time Series Performance of Banks in Peer Groups

Bank's Name	NPL Performance Ratings				
	Dec-2015	Mar-2016	Jun-2016	Sep-2016	Des 2016
Bank Jasa Jakarta(BJJ)	4	3	2	2	2
BN Parahyangan	12	13	13	13	13
BOII	14	14	15	15	15
Bumi Arta	7	6	8	9	7
Capital	8	4	4	4	10
Ganesha	15	15	9	7	5
Index	9	7	11	11	9
MAS	3	2	5	3	8
Maspion	6	5	6	5	4
Mayora	5	10	10	8	11
Metro Express	2	9	3	10	3
National NOBU	1	1	1	1	1
Sahabat Sampoerna	11	12	12	12	12
SBI Indonesia	13	11	14	14	14
Windu (CCBI)	10	8	7	6	6

ROA (Return on Assets) is a variable that has the greatest ability in predicting public banks stock prices which in this case represent award market to the performance of the banks. ROA of banks operating in Indonesia significant positively influence on public bank stock prices. The coefficient of determination of ROA on public bank stock prices reached 54.8 % [11]. Regarding to the ROA, the rating is set in an ascending

pattern from small to large. Rank 1 is given to a bank that get best ROA performance, which after the capital equity equalization, generates the largest ROA, thereby declaring the bank's ability to generate profits. The greater ROA generated by a bank, the better the bank's position in terms of asset use. In this case, although Bank Jasa Jakarta (BJJ) core capital is not the largest among the existing banks in the established peer group, but Bank Jasa Jakarta is able to be the best bank in the ROA management for 4 quarters out of 5 the quarter observed as shown in Table 3 and Fig 2. Thus BJJ is a bank that has excellence ability to generate profits in terms of asset use. BJJ performance achievement in terms of ROA is one of the reasons why Bank Jasa Jakarta awarded by Diamond Trophy Infobank Awards 2017 for the category of Bank Performance Award "Excellent" for 20 Years successively.

Table 3. ROA Time Series Performance of Banks in Peer Groups

Bank's Name	ROA Performance Ratings				
	Dec-15	Mar-16	Jun-16	Sep-16	Des 2016
Bank Jasa Jakarta (BJJ)	1	2	1	1	1
BN Parahyangan	10	15	11	11	14
BOII	14	8	15	15	15
Bumi Arta	7	7	8	8	7
Capital	9	13	9	9	9
Ganesha	3	1	4	4	3
Index	2	6	6	5	2
MAS	5	5	5	6	5
Maspion	6	4	3	3	4
Mayora	8	9	7	7	6
Metro Express	11	3	2	2	11
National NOBU	13	14	14	12	10
Sahabat Sampoerna	4	10	10	10	8
SBI Indonesia	15	11	13	14	13
Windu (CCBI)	12	12	12	13	12

Table 4. Profits Performance Time Series of Banks in Peer Groups

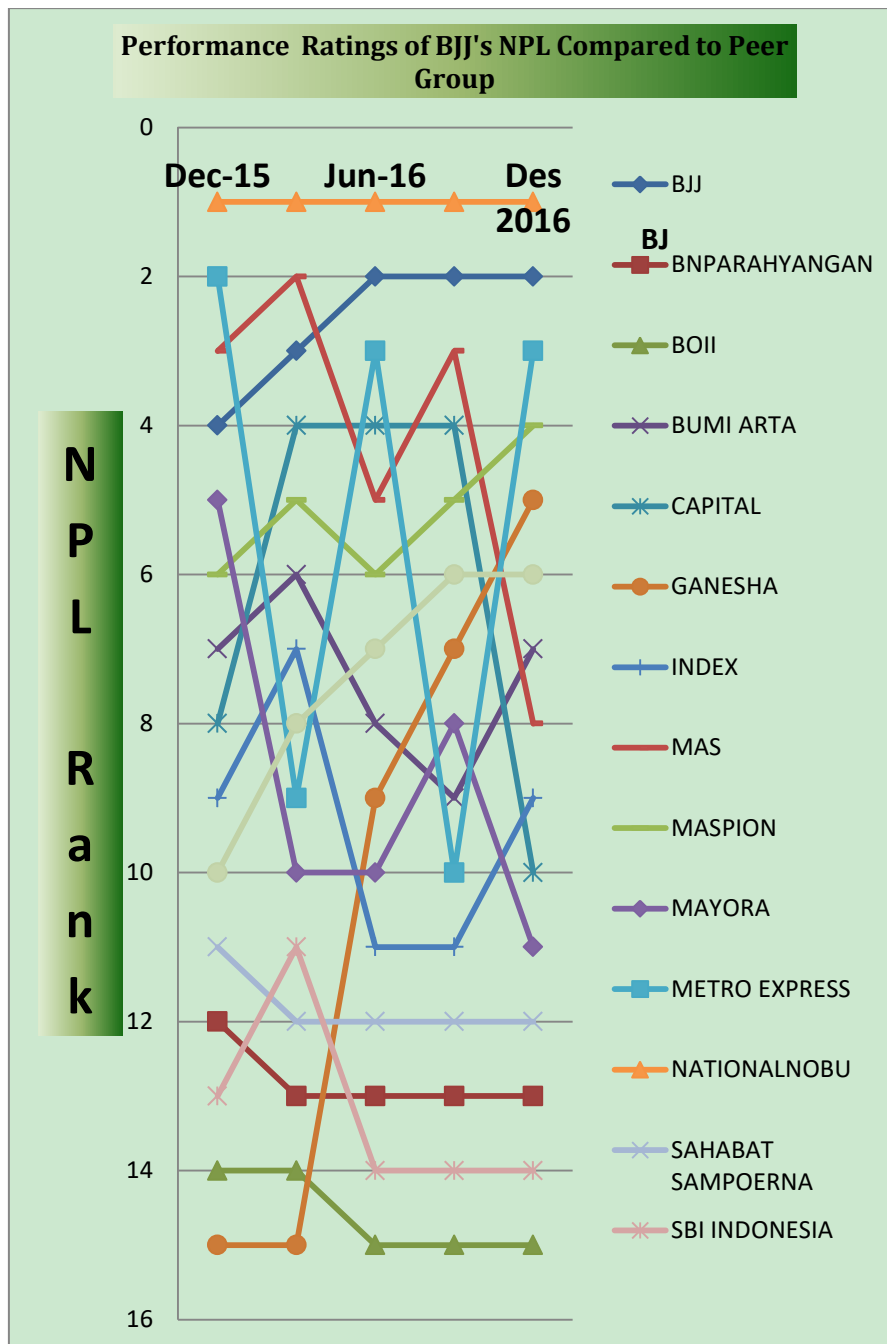| Bank's name	Profit Performance				
	Dec-2015	Mar-2016	Jun-2016	Sep-2016	Des 2016
Bank Jasa Jakarta (BJJ)	2	1	1	1	1
BN Parahyangan	5	14	7	2	13
BOII	14	15	15	3	15
Bumi Arta	8	3	6	4	4
Capital	3	7	3	5	6
Ganesha	11	5	11	6	8
Index	1	2	2	7	2
MAS	9	6	5	8	5
Maspion	7	4	4	9	3
Mayora	10	10	8	10	7
Metro Express	13	11	12	11	12
National NOBU	12	12	13	12	11
Sahabat Sampoerna	4	8	10	13	9
SBI Indonesia	15	13	14	14	14
Windu (CCBI)	6	9	9	15	10

Fig. 1. NPL time series performance of banks in peer groups.

Time series analysis on profit performance reflects the bank's ability to manage bank profitability. The results of the analysis on profit performance should be sync with the results on the performance of ROA. Regarding to the Profit variable, the ranking is set in an ascending pattern from small to large. Rank 1 is awarded to a bank that get best profit performance, which after the capital equity is equal, generates the largest profit. According to this, Bank Jasa Jakarta was able to show as the best bank in the ranking of profit for 4 quarters of the 5 quarters observed as shown in Table 4 and Fig. 3. These findings further prove BJJ as a bank that has the ability to generate profits. The result of this analysis based on peer group model is one of the proponents of BJJ's award for various awards such as the award of Indonesian Banking Awards 2016 for Best Bank In Financial Aspects award category – Non Public Bank with The Best Rank, Business Indonesia Banking Award 2016 for category of Most Efficient Bank awards Category Bank BUKU 2,

Indonesia Banking Award 2016 for the category of The Most Reliable Bank, The Most Efficient Bank, The Best Bank In Productivity, Titanium Trophy Infobank Awards 2016 Award for "Excellent" Performance Bank Award for 19 Year successively.
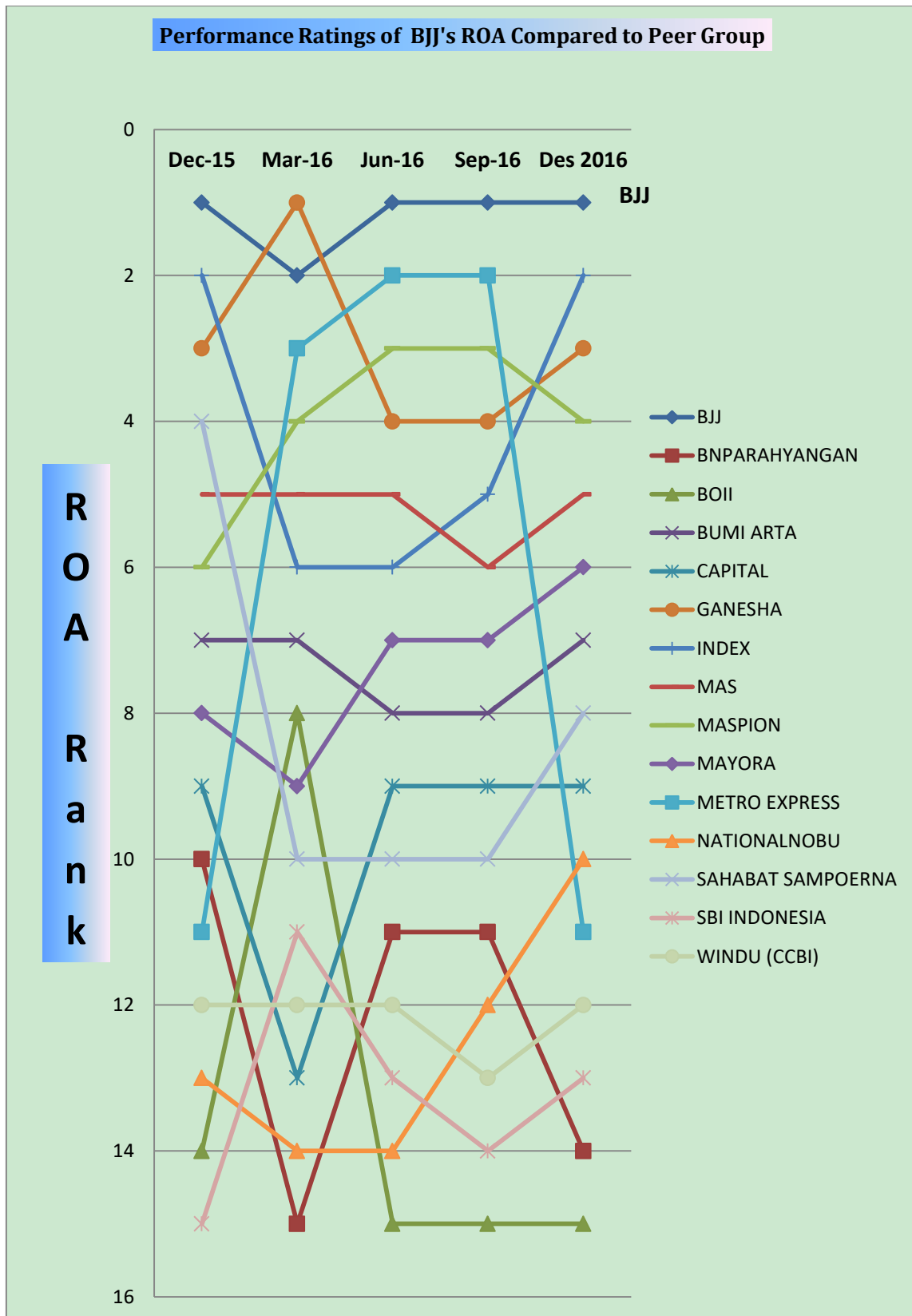

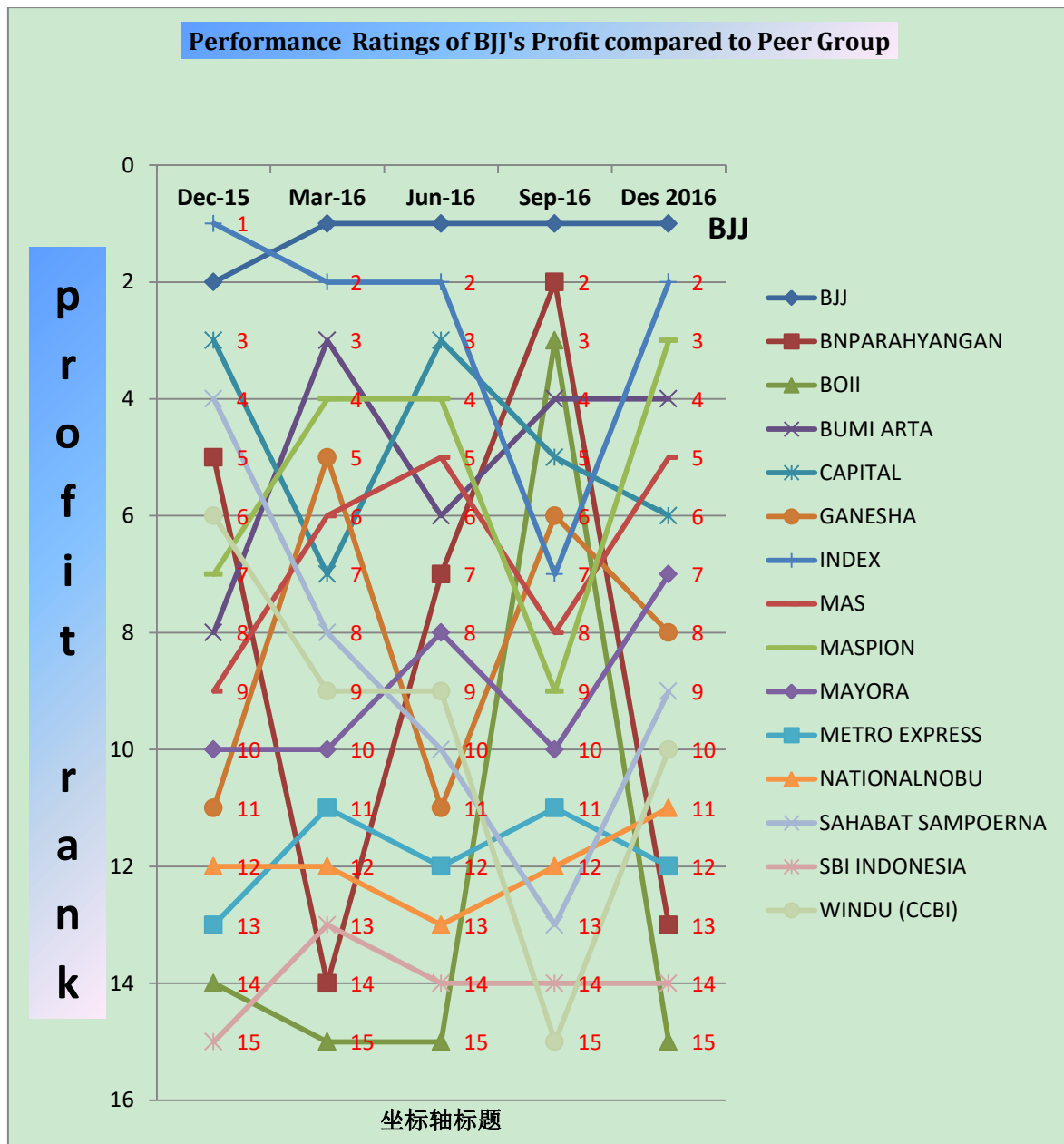Fig. 2. ROA time series performance graphs of banks in peer groups.

Fig. 3. Profits time series performance charts of banks in peer groups.

5. Conclusion

Considering that the bank's peer group model after going through the consistency test process using cross section and time series data is proven reliable and scientifically accountable model then this model can be tested for wider use as a benchmark of objective performance monitoring of banks operating in Indonesia.

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