Analysis of CAMEL, Z-score, and bankometer in assessment soundness of banking listed on the Indonesia stock exchange (IDX) from 2012-2015

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Abstract:

This study analyses the soundness of banking companies listed in the Indonesia Stock Exchange (IDX) during the period of 2012-2015 using CAMEL, Z-Score and Bankometer analysis tools. The study aims to find the differences and appropriate analytical tools that can be used in analysing the health of a banking company in Indonesia. Existing samples in this study were 23 banking firms. After analysing the financial statements and calculating the variables, research showed that there were differences from each analysis tool.

According to the results of the analysis of CAMEL throughout the years 2012-2015, there is diverse soundness of the banking firm. There is a healthy bank, banks are quite healthy and there are less healthy banks. Then from the analysis of the Z-Score results using the same timeframe, results show there was no sound bank, but that the bank is in a grey area (grey zone) and there are some banks that have a strong potential for bankruptcy. While the results of the analysis from Bankometer indicated that during 2012-2015, all banks are in a healthy condition. Based on the results of research and analysis conducted, the analytical tools that can be used to analyse the health of banking in Indonesia is CAMEL. Z-Score analysis and Bankometer are options that can be used to supplement the results of the analysis of CAMEL; they cannot be used to replace the CAMEL tool, just remain complementary.

Keywords: soundness of bank; CAMEL; Z-score; bankometer

JEL Classification: G21; G33

Introduction

One of the functions of a bank is to act as a financial intermediary between those who have surplus funds with those who need funds. To carry out this function, the trust of the society is a major factor for bank. The bank's management faces several efforts to maintain trust. One of requirements is maintain the health of bank. The health of bank is a concern of all stakeholders: both owners and managers of banks, the society as users of bank services, and Bank Indonesia as the supervisor of the bank providing oversight from the government. If the bank can maintain its health, then the bank will surely gain the trust.

Some liquidation events that have occurred show that there are banks that have not been able to maintain their health. On November 1, 1997, the Government officially closed 16 commercial banks that are not healthy in order to more effectively nourish the Indonesian banking system (www.print.kompas.com). During 2011, the Indonesia Deposit Insurance Corporation (Lembaga Penjamin Simpanan, LPS) liquidated 15 banks in Indonesia (www.finance.detik.com) and in 2014, the Indonesia Deposit Insurance Corporation (LPS) had to liquidated 60 banks consisting of 59 rural banks and 1 commercial bank because these banks were not healthy (www.ekbis.sindonews.com). Another event since the beginning of January 2016 to May 2016 focused on the Indonesia Deposit Insurance Corporation (LPS) liquidating 5 rural banks due to the average capital adequacy ratio of the banks being minus 209.97% (www.infobanknews.com).

The above events show that it is important for banks to constantly maintain and analyse the level of their health. The goal was to determine the actual condition of the bank using the analogy of health: that is, a bank is in good health, is less healthy or is sick. The technique used for assessment of bank health is CAMEL, which is comprised of Capital, Asset Quality, Management, Earnings and Liquidity. Roman and Sargu (2013), for example,

were able to analyse the health of 15 banks in Romania using the CAMELS approach and advised banks to improve and enhance its performance.

In addition to using CAMEL analysis, banks can also use the method of Altman's Z-Score. For service companies, Altman developed a Z-Score of four ratios that were comprised of Working Capital to Total Assets, Retained Earnings to Total Assets, Earnings Before Interest and Taxes to Total Assets, and Market Value Equity to Total Liabilities. Research conducted by Al Zaabi (2011) shows the Z-Score model can predict bankruptcy and measures the financial performance of Islamic Bank in the UAE. Anjum (2012) states that Altman's Z-Score model can be applied in modern economics to predict distress and bankruptcy from one, two and three years in advance.

Going beyond the CAMEL and Z Score models and based on the recommendation of the International Monetary Fund (IMF), bank health can also be measured through the Bankometer equation (S-Score). The ratio used in this Bankometer consists of six ratios: namely Capital Asset Ratio (CA), Equity to Asset (EA), Capital Adequacy Ratio (CAR), Non-Performing Loans (NPL), Cost to Income (CI), and Loan to Asset (LA). Yameen and Ali (2016) analysed 13 banks using the Bankometer and the result is the banks are in good health and that Bankometer models are considered capable of detecting the problem of bankruptcy and can help quantify the problem of solvency.

In reference to these three models, the current research is conducted to analyse the soundness of banking companies that are listed on the Indonesia Stock Exchange (IDX) in the 2012-2015 period by using CAMEL, Z-Score, and Bankometer. This conceptual framework was adapted from Erari *et al.* (2013).

The research conducted by Erari *et al.* (2013) applies CAEL, Z-Score and Bankometer to analyse the performance of the Bank of Papua and then compares the results of the analysis. The results of the analysis CAEL and Bankometer show that Bank Papua is in a healthy condition four the years between 2003-2011, whereas the Z-Score analysis shows that the Bank Papua in 2007 and 2011 to be in bankruptcy.

However, limitation in the results from the study by Erari *et al.* (2013) can be found in that they used only one sample bank, Bank Papua in the 2003-2011 period. The current research avoids this limitation and therefore uses 23 banking companies listed in Indonesia Stock Exchange (IDX) in the 2012-2015 period as the sample. In addition, this research uses CAMEL in contrast to Erari *et al.* (2013) that use CAEL. The inclusion of management (M) in the model is important to the current research.

Based on above background, the research objectives therefore are:
- to analyse the soundness of banking companies listed in Indonesia Stock Exchange (IDX) in the period 2012-2015 by using CAMEL;
- to analyse the soundness of banking companies listed in Indonesia Stock Exchange (IDX) in the period 2012-2015 by using Z-Score;
- to analyse the soundness of banking companies listed in Indonesia Stock Exchange (IDX) in the period 2012-2015 by using Bankometer;
- to examine the difference between CAMEL, Z-Score and Bankometer in assessing the soundness of banking companies listed in Indonesia Stock Exchange (IDX) in the period 2012-2015.

1. Literature review

1.1. Bank and the soundness

According to Kasmir (2015), a bank is a financial institution whose main activities are collecting funds from the public and making funds available to the community and providing other banking services. The bank's financial statements show the overall financial condition of the bank. These financial statements act as measures of the actual condition of the bank, and can demonstrate the performance of the bank's management during the period.

Based on Circular of Bank Indonesia (*Surat Edaran Bank Indonesia*) No. 6/23/DPNP/2004, the soundness of banks is the result of qualitative assessments of various aspects affecting the condition or performance of a bank through the assessment for capital, asset quality, management, earnings, and liquidity. The health of a bank is the concern of all stakeholders, both owners and managers of banks, the society as users of bank services, and of Bank Indonesia as the supervisor of the bank from the government.

Given their important role in the financial well-being of communities, it is necessary to assess the soundness of banks. The goal is to determine if the actual condition of the bank is in good health, less healthy or sick. If the condition of banks in a healthy condition, it is necessary to maintain health. However, if the bank in an unhealthy conditions backspace, then immediate action should be taken to solve it (Kasmir 2015).

1.2. CAMEL

Reddy and Prasad (2011) defines CAMEL basically is a ratio based model for evaluating the performance of a bank. The model is a management tool to measure capital adequacy, asset quality, management efficiency, earnings quality and liquidity of financial institutions. The results of CAMEL measurement determine which bank is categorized as healthy, quite healthy, less healthy and unhealthy. Reddy and Prasad (2011) adapted the CAMEL model to measure the financial soundness of regional rural banks, namely Andhra Pragathi Grameena Bank and Sapthagiri Grameena Bank. Research shows that the overall performance of Andhra Pragathi Grameena Bankis better than Sapthagiri Grameena Bank.

Shar *et al.* (2010) use the CAMEL model to evaluate the performance and efficiency of the banking sector in Pakistan at the time before and after reforms. The results showed that before the reform of the banks in Pakistan there was in chaos. But overall after the reform, the soundness of the banking sector showed improvement and the positive impact of the reforms.

Adjacent to Pakistan, Reddy (2012) conducted a study using the CAMEL approach for evaluating the performance of the Bank of India. Reddy (2012) concluded that the CAMEL approach is an important tool for assessing the financial strength of a bank and it is helpful in suggesting necessary action to rectify the weaknesses of the Bank. The model was further reinforced by Roman and Sargu (2013) who analysed the health of 15 banks in Romania using the CAMEL approach and from the research, they suggested the 15 banks needed to improve and enhance their performance.

Erari *et al.* (2013) apply the CAEL model in analysing the financial performance of the Bank Papua from year 2003 to 2011. Analysis with the CAEL model shows that the Bank Papua during the year 2003-2011 was in a good health condition, very liquid, had strong capital, could manage well, had good profitability, asset quality was good but that the Bank Papua still lacked in efficiency.

Furthermore, Yuksel *et al.* (2015) examined the effect of the ratio of CAMEL as a determinant of the level of credit from deposit banks in Turkey. The results showed that the three components of CAMEL, namely Asset Quality, Management, and Sensitivity to Market Risk influential in the level of credit while the Capital Adequacy and Earning no effect. Turkish deposit banks should focus on fixed assets and interest income to have a better ranking.

1.3. Z-Score

Altman (1968) examined the use of financial ratio analysis with discriminant analysis, which is ultimately used as a tool for predicting corporate bankruptcy. The Z-Score was developed to predict the bankruptcy of a manufacturing company with about an 80% accuracy rate. But it is not accurate in predicting the likelihood of financial distress in the banking industry so in the next period the Z-Score model was developed to assess the bankruptcy of the banking industry and indicates the level of accuracy to be 70% (Qamruzzaman 2014).

Al Zaabi (2011), utilizing Z-Score model to predict bankruptcy and measure the financial performance of existing Islamic Bank in the UAE, introduced the Z-Score as a beneficial tool in calculating the possible causes ofdeclining financial performance. Also, Anjum (2012) concluded that the Altman Z-Score can be applied to modern economies in predicting distress and bankruptcy of one, two and three years.

Research conducted by Erari *et al.* (2013) applied the Z-Score in analysing the financial performance of the Bank Papua from2003 to 2011 states that the Z-Score analysis is able to pinpoint the critical situation faced by the Bank Papua in 2007 and 2011. While Duvvuri (2012) measures the health of the company Nagarjuna Fertilizers and Chemicals Limited by using the Z-Score with the results showing that the company successfully passed the grey zone leading to a safer zone. Using this model is an opportunity for investors who are interested in the fertilizer industry so that they can comfortable investing their funds in the company.

Then, Madona and Cestari (2015) verify the accuracy of three bankruptcy prediction models. These are the Altman Z-Score, Alberici Z-Score and discrimination functions of Bottani, Cipriani and Serao in companies located in the region of Emilia, Italy. The result is that the Altman Z-Score was able to detect signs of failure andable to distinguish companies that fail or thrive.

Moreover, research conducted by El Khoury and Al Beaino (2014) in classifying eleven manufacturing companies in Lebanon found that the Altman Z-Score, in addition to predicting bankruptcy, can also serve as a barometer to classify a company. These findings can be used by banks to classify their clients, and also can the used by the company to evaluate their performance as well as used by investors to pick stocks.

1.4. Bankometer

In 2002, the International Monetary Fund (IMF) developed a new model called Bankometer (S-Score). This model is a modification from the CAMELS and CLSA stress test parameters. The modification was made only to

synthesize the measurement of banks soundness. This procedure has a minimum number of parameters with a maximum of accurate results (Qamruzzaman 2014).

Yameen and Ali (2016) used Bankometer to evaluate the financial health of 13 banks located in Jordan. It can be concluded that the 13 banks examined are financially healthy. Bankometer model can help internal management of a bank to avoid bankruptcy with precise control over their operations and can help quantify the problem of solvency. A study conducted by Qamruzzaman (2014) compares the Z-Score model and Bankometer in assessing the financial health of private banks in Bangladesh for the period 2008 to 2012. The result of the Bankometer model shows the Bank to be in good financial health, while the Z-Score model shows the possibility of bankruptcy.

Meanwhile, Erari *et al.* (2013) who applied the CAEL, Z-Score and Bankometer models in analysing the financial performance of the Bank Papua from year 2003 to 2011 states that analysis with the Bankometer model showed similar results with the CAEL model. Results indicate that Bank Papua during the year 2003-2011 was in the "good" health condition, highly liquid, has strong capital, able to manage debt well, has good profitability, asset quality is good but still lacking in efficiency. Then, Nimalathasan *et al.* (2012) examined the financial condition of the Bank in Sri Lanka using Bankometer. The results showed that the government banks are in a better solvency position than the private banks.

Fayed (2013) analyses and compares the performance of three Islamic banks and six conventional banks in Egypt by using financial ratios to measure profitability, liquidity and credit risks as well as utilizes Bankometer for measuring solvency. The results showed that the conventional banks are superior to Islamic banks.

Then, Shar *et al.* (2010) applies Bankometer, CAMEL and CLSA stress tests on the banking sector in Pakistan. Banks that are healthy through stress tests CLSA also were declared healthy through Bankometer test results. Shar *et al.* (2010) concluded that Bankometer can be used by individuals or companies to analyse the solvency and soundness of a bank and that it can help internal management to avoid bankruptcy.

Shamanth and Rajgopal (2016) also considered that the Bankometer method can be used to assess the financial performance of banks. This is based on the research they conducted against eight banks in India using Bankometer. The results show that the banks are very liquid, possess strong capital are able to manage debt properly, have profitability and have good asset quality.

2. Methodology

The current research is designed to analyse the soundness of banking companies by using CAMEL, Z-Score, and Bankometer and aims to explore the difference of the three models in assessing the soundness of banking companies. This study concentrates on the four-year period from 2012 to 2015 and uses secondary data, which is comprised of financial statements of each bank. Table 1 shows the 23 banks used as a sample in this study. The 23 banks are listed in Indonesia Stock Exchange (IDX) from 2012-2015.

Table 1. Sample of banking company

No.	Code	Bank Name
1.	AGRO	Bank Rakyat Indonesia Agroniaga Tbk
2.	BABP	Bank MNC Internasional Tbk
3.	BBCA	Bank Central Asia Tbk
4.	BBKP	Bank Bukopin Tbk
5.	BBNI	Bank Negara Indonesia (Persero) Tbk
6.	BBRI	Bank Rakyat Indonesia (Persero) Tbk
7.	BBTN	Bank Tabungan Negara (Persero) Tbk
8.	BDMN	Bank Danamon Indonesia Tbk
9.	BJBR	Bank Pembangunan Daerah Jawa Barat dan Banten Tbk
10.	BKSW	Bank QNB Indonesia Tbk
11.	BMRI	Bank Mandiri (Persero) Tbk
12.	BNBA	Bank Bumi Arta Tbk
13.	BNGA	Bank CIMB Niaga Tbk
14.	BNII	Bank Maybank Indonesia Tbk
15.	BNLI	Bank PermataTbk
16.	BSIM	Bank Sinar Mas Tbk
17.	BSWD	Bank of India Indonesia Tbk
18.	BVIC	Bank Victoria International Tbk
19.	INPC	Bank Artha Graha Internasional Tbk

No.	Code	Bank Name
20.	MAYA	Bank Mayapada Internasional Tbk
21.	MCOR	Bank Windu Kentjana Internasional Tbk
22.	NISP	Bank NISP OCBC Tbk
23.	PNBN	Bank PAN Indonesia Tbk

2.1. Data analysis

CAMEL analysis

According to Rivai (2013), the CAMEL method comprises the steps assessed by calculating the ratio of the components in place (2013). Those components include:

- Capital: CAMEL component in the capital can use the Capital Adequacy Ratio (CAR);
- Asset Quality: The indicators used to assess the asset component is Non-Performing Loan (NPL);
- Management: Assessment of management can use indicators Net Profit Margin (NPM) on the assumption that all management activities are aimed at achieving operating profits of an enterprise;
- Earnings: Assessment can be done by calculating the Return on Assets (ROA) and Operating Expenses to Operating Income (ROA);
- Liquidity: Rate liquidity can be measured with a Loan to Deposit Ratio (LDR).

After calculating the ratio used later calculating the credit point for each CAMEL ratio and multiplying the credit point by the weight of each component. After that, sum throughout the value component of CAMEL and stipulate the category of health of banks based on the value obtained. The predicate of bank soundness is shown in Table 2.

Table 2. Predicate of Bank Soundness

Credit Score of CAMEL	Predicate
81-100	Healthy
66 - < 81	Quite Healthy
51 - < 65	Less Healthy
0 - < 51	Not Healthy

Z-Score analysis

The formula used for banking companies are:

$$Z = 6{,}56 X_1 + 3{,}26 X_2 + 6{,}72 X_3 + 1{,}05 X_4 \tag{1}$$

where: X1 = Working Capital / Total Assets; X2 = Retained Earnings / Total Assets; X3 = Earnings Before Interest and Taxes / Total Assets; X4 = Market Value Equity / Total Liabilities.

After calculation by the above formula, the Z-Score value will be obtained and describes the condition of the banking company, which is divided into three levels, namely:

- Z-Score greater than 2.60: then the company is classified as a financially stable company (safe zone);
- Z-Score is between 1,1 to 2,60: then the company is classified to be in the grey zone, which means there is a potential the company will fall into bankruptcy;
- Z-Score is below 1.1: then the company is considered to have a strong potential for bankruptcy.

Bankometer analysis

The formula used is as follows:

$$S = 1{,}5CA + 1{,}2EA + 3{,}5CAR + 0{,}6NPL + 0{,}3CI + 0{,}4LA \tag{2}$$

where: CA = Capital to Asset Ratio, according to the guidelines of the IMF, the minimum threshold for this ratio is 4% (Erari *et al.* 2013); EA = Equity to Asset Ratio, according to the IMF, this ratio should be more than 2% (Erari *et al.* 2013); CAR = Capital Adequacy Ratio; IMF sets limits on the minimum ratio is 8% (Erari *et al.* 2013); NPL = Non-Performing Loans; IMF gives limits NPL ratio should be below 15%; CI = Cost to Income Ratio, limits provided by the IMF for this ratio is below 40% (Erari *et al.* 2013); LA = Loans to Asset Ratio; IMF imposed a limit of this ratio should be lower than 65% (Erari *et al.* 2013).

Based on the value of S-Score obtained, the condition of the banking company is:
- S <50 can be interpreted as companies experiencing financial difficulties and the risk is high;

▪ 50 <S <70 then the company is in the grey zone and is vulnerable to experiencing financial difficulties;
▪ S> 70 provides an assessment that the company is in very good health.

3. Results

Table 3 shows the soundness of banks based on CAMEL analysis. From the CAMEL analysis can be seen that the soundness of banks from year 2012-2015 are varied. In 2012, there were three healthy banks, namely Bank Central Asia Tbk, Bank Rakyat Indonesia (Persero) Tbk and Bank Mandiri (Persero) Tbk. Then are two banks that are less healthy: Bank MNC Internasional Tbk and Bank QNB Indonesia Tbk. While the soundness of 18 other banks are quite healthy, they consist of Bank Rakyat Indonesia Agroniaga Tbk, Bank Bukopin Tbk, Bank Negara Indonesia (Persero) Tbk, Bank Tabungan Negara (Persero) Tbk, Bank Danamon Indonesia Tbk, Bank Pembangunan Daerah Jawa Barat dan Banten Tbk, Bank Bumi Arta Tbk, Bank CIMB Niaga Tbk, Bank Maybank Indonesia Tbk, Bank Permata Tbk, Bank Sinar Mas Tbk, Bank of India Indonesia Tbk, Bank Victoria International Tbk, Bank Artha Graha Internasional Tbk, Bank Mayapada Internasional Tbk, Bank Windu Kentjana Internasional Tbk, Bank NISP OCBC Tbk, dan Bank PAN Indonesia Tbk

In 2013, Bank Negara Indonesia (Persero) Tbk managed to increase the value of NPL and NPM, which causes the soundness of Bank Negara Indonesia (Persero) Tbk to increase from quite healthy to be healthy. That is, the number of healthy banks into four: Bank Central Asia Tbk, Bank Rakyat Indonesia (Persero) Tbk, Bank Mandiri (Persero) Tbk and Bank Negara Indonesia (Persero) Tbk. The model also shows the number of banks that are quite healthy in 2013 was reduced to 17 banks. Meanwhile, two other banks are still at unhealthy levels, namely MNC Bank Internasional Tbk and Bank QNB Indonesia Tbk.

Table 3. Calculation results CAMEL of the Twenty-Three Bank in Indonesia, 2012-2015 Period

Bank	Year	Net Value of CAR	Net Value of NPL	Net Value of NPM	Net Value of ROA	Net Value of BOPO	Net Value of LDR	Net Value Total of CAMEL Ratio	The soundness degree
Bank Rakyat Indonesia Agroniaga Tbk.	2012	25,00	27,88	2,27	5,00	5,00	10,00	75,15	Quite Healthy
	2013	25,00	29,16	2,78	5,00	5,00	10,00	76,94	Quite Healthy
	2014	25,00	28,36	2,33	4,90	5,00	10,00	75,59	Quite Healthy
	2015	25,00	28,36	2,39	5,00	5,00	10,00	75,75	Quite Healthy
Bank MNC Internasional Tbk	2012	23,73	23,02	0,04	0,30	0,20	10,00	57,28	Less Healthy
	2013	25,00	26,28	-2,68	0,00	0,00	10,00	58,60	Less Healthy
	2014	25,00	23,28	-1,68	0,00	0,00	10,00	56,60	Less Healthy
	2015	25,00	26,14	0,20	5,00	0,64	10,00	66,99	Quite Healthy
Bank Central Asia Tbk	2012	25,00	30,00	8,31	5,00	5,00	10,00	83,31	Healthy
	2013	25,00	30,00	8,44	5,00	5,00	10,00	83,44	Healthy
	2014	25,00	30,00	7,77	5,00	5,00	10,00	82,77	Healthy
	2015	25,00	30,00	7,63	5,00	5,00	10,00	82,63	Healthy
Bank Bukopin Tbk	2012	25,00	27,88	3,61	5,00	5,00	10,00	76,48	Quite Healthy
	2013	25,00	27,88	3,53	5,00	5,00	10,00	76,41	Quite Healthy
	2014	25,00	26,86	2,09	4,10	5,00	10,00	73,05	Quite Healthy
	2015	25,00	26,74	2,54	4,63	5,00	10,00	73,92	Quite Healthy
Bank Negara Indonesia (Persero) Tbk	2012	25,00	29,40	5,66	5,00	5,00	10,00	80,06	Quite Healthy
	2013	25,00	30,00	6,31	5,00	5,00	10,00	81,31	Healthy
	2014	25,00	30,00	6,36	5,00	5,00	10,00	81,36	Healthy
	2015	25,00	29,20	4,99	5,00	5,00	10,00	79,19	Quite Healthy
Bank Rakyat Indonesia (Persero)	2012	25,00	30,00	8,06	5,00	5,00	10,00	83,06	Healthy
	2013	25,00	30,00	7,87	5,00	5,00	10,00	82,87	Healthy
	2014	25,00	30,00	7,18	4,90	5,00	10,00	82,08	Healthy
	2015	25,00	29,96	6,49	5,00	5,00	10,00	81,45	Healthy
Bank Tabungan Negara (Persero) Tbk	2012	25,00	24,76	3,63	5,00	5,00	5,64	69,03	Quite Healthy
	2013	25,00	24,92	3,38	5,00	5,00	4,23	67,54	Quite Healthy
	2014	25,00	25,48	2,09	3,80	5,00	2,46	63,83	Quite Healthy
	2015	25,00	26,78	2,88	5,00	5,00	2,49	67,15	Quite Healthy
Bank Danamon Indonesia Tbk	2012	25,00	30,00	4,38	5,00	5,00	5,72	75,10	Quite Healthy
	2013	25,00	28,80	4,11	5,00	5,00	7,96	75,87	Quite Healthy
	2014	25,00	28,40	2,46	4,65	5,00	8,96	74,47	Quite Healthy
	2015	25,00	27,20	2,33	4,00	5,00	10,00	73,53	Quite Healthy
	2012	25,00	30,00	4,19	5,00	5,00	10,00	79,19	Quite Healthy

Bank	Year	Net Value of CAR	Net Value of NPL	Net Value of NPM	Net Value of ROA	Net Value of BOPO	Net Value of LDR	Net Value Total of CAMEL Ratio	The soundness degree
Bank Pembangunan Daerah Jawa Barat dan Banten Tbk	2013	25,00	29,72	4,01	5,00	5,00	7,41	79,19	Quite Healthy
	2014	25,00	28,92	2,94	5,00	5,00	8,73	79,19	Quite Healthy
	2015	25,00	29,28	3,24	5,00	5,00	10,00	77,52	Quite Healthy
Bank QNB Indonesia Tbk	2012	25,00	30,00	-1,96	0,00	0,00	10,00	63,05	Less Healthy
	2013	25,00	30,00	0,13	0,30	0,00	0,68	56,11	Less Healthy
	2014	25,00	30,00	2,12	3,50	5,00	8,61	74,23	Less Healthy
	2015	25,00	26,20	1,73	2,90	5,00	0,98	61,82	Less Healthy
Bank Mandiri (Persero) Tbk	2012	25,00	30,00	7,37	5,00	5,00	10,00	82,37	Healthy
	2013	25,00	30,00	7,26	5,00	5,00	10,00	82,26	Healthy
	2014	25,00	30,00	6,68	5,00	5,00	10,00	81,68	Healthy
	2015	25,00	29,68	1,73	5,00	5,00	10,00	76,41	Quite Healthy
Bank Bumi Arta Tbk	2012	25,00	30,00	4,31	5,00	5,00	10,00	79,31	Quite Healthy
	2013	25,00	30,00	3,39	5,00	5,00	10,00	78,39	Quite Healthy
	2014	25,00	30,00	2,35	5,00	5,00	10,00	77,35	Quite Healthy
	2015	25,00	30,00	2,07	4,43	5,00	10,00	76,51	Quite Healthy
Bank CIMB Niaga Tbk.	2012	25,00	30,00	5,62	5,00	5,00	7,98	78,60	Quite Healthy
	2013	25,00	27,90	5,24	5,00	5,00	8,20	76,35	Quite Healthy
	2014	25,00	27,12	2,56	4,80	5,00	6,22	76,35	Quite Healthy
	2015	25,00	27,82	0,45	0,80	1,64	6,81	62,51	Less Healthy
Bank Maybank Indonesia Tbk	2012	25,00	29,38	2,62	5,00	5,00	10,00	76,99	Quite Healthy
	2013	25,00	27,90	2,91	5,00	5,00	10,00	75,81	Quite Healthy
	2014	25,00	28,04	1,19	2,25	4,41	9,54	70,43	Quite Healthy
	2015	25,00	26,16	1,73	3,37	5,00	10,00	71,26	Quite Healthy
Bank Permata Tbk	2012	25,00	30,00	3,53	5,00	5,00	10,00	78,53	Quite Healthy
	2013	25,00	30,00	3,59	5,00	5,00	10,00	78,59	Quite Healthy
	2014	25,00	29,80	2,45	4,00	5,00	10,00	76,24	Quite Healthy
	2015	25,00	28,20	0,37	0,67	0,69	10,00	64,92	Less Healthy
Bank Sinar Mas Tbk	2012	25,00	25,86	2,37	5,00	5,00	10,00	73,23	Quite Healthy
	2013	25,00	26,76	2,22	5,00	5,00	10,00	73,98	Quite Healthy
	2014	25,00	25,88	1,28	3,40	3,41	10,00	68,97	Quite Healthy
	2015	25,00	25,02	1,11	3,17	5,00	10,00	69,30	Quite Healthy
Bank of India Indonesia Tbk	2012	25,00	29,28	6,30	5,00	5,00	8,72	79,29	Quite Healthy
	2013	25,00	29,38	6,67	5,00	5,00	8,50	79,55	Quite Healthy
	2014	25,00	29,84	5,60	5,00	5,00	10,00	80,44	Quite Healthy
	2015	25,00	21,08	-1,93	0,00	0,00	10,00	54,15	Less Healthy
Bank Victoria International Tbk	2012	25,00	27,48	4,28	5,00	5,00	10,00	76,76	Quite Healthy
	2013	25,00	30,00	3,85	5,00	5,00	10,00	78,85	Quite Healthy
	2014	25,00	25,78	1,22	2,65	4,22	10,00	68,87	Quite Healthy
	2015	25,00	23,14	1,06	2,17	3,82	10,00	65,18	Less Healthy
Bank Artha Graha Internasional Tbk	2012	25,00	29,40	1,72	2,20	4,36	10,00	72,67	Quite Healthy
	2013	25,00	27,48	2,79	4,63	5,00	10,00	74,90	Quite Healthy
	2014	25,00	27,62	1,20	2,65	5,00	10,00	71,47	Quite Healthy
	2015	25,00	28,50	0,71	1,10	2,09	10,00	67,39	Quite Healthy
Bank Mayapada Internasional Tbk	2012	23,29	26,72	3,79	5,00	5,00	10,00	73,80	Quite Healthy
	2013	25,00	29,80	4,08	5,00	5,00	10,00	78,88	Quite Healthy
	2014	22,22	28,08	2,98	5,00	5,00	10,00	73,28	Quite Healthy
	2015	25,00	26,48	3,23	5,00	5,00	10,00	74,71	Quite Healthy
Bank Windu Kentjana Internasional Tbk	2012	25,00	28,12	3,78	5,00	5,00	10,00	76,90	Quite Healthy
	2013	25,00	28,34	2,87	5,00	5,00	10,00	76,21	Quite Healthy
	2014	25,00	26,14	1,44	2,65	4,26	10,00	69,48	Quite Healthy
	2015	25,00	27,74	1,65	3,43	5,00	10,00	72,82	Quite Healthy
Bank NISP OCBC Tbk	2012	25,00	30,00	3,97	5,00	5,00	10,00	78,97	Quite Healthy
	2013	25,00	30,00	4,07	5,00	5,00	9,00	78,07	Quite Healthy
	2014	25,00	29,40	3,85	5,00	5,00	8,56	78,07	Quite Healthy
	2015	25,00	29,44	3,73	5,00	5,00	6,78	74,94	Quite Healthy
	2012	25,00	30,00	4,40	5,00	5,00	10,00	79,40	Quite Healthy

Bank	Year	Net Value of CAR	Net Value of NPL	Net Value of NPM	Net Value of ROA	Net Value of BOPO	Net Value of LDR	Net Value Total of CAMEL Ratio	The soundness degree
Bank PAN Indonesia Tbk	2013	25,00	29,50	4,35	5,00	5,00	10,00	78,85	Quite Healthy
	2014	25,00	29,96	3,81	5,00	5,00	7,81	76,59	Quite Healthy
	2015	25,00	29,90	2,25	4,37	5,00	6,47	72,98	Quite Healthy

Source: data calculated by researchers, 2016

The study showed in 2014 the number of healthy banks are still same as in 2013, namely four banks consisting of Bank Central Asia Tbk, Bank Rakyat Indonesia (Persero) Tbk, Bank Mandiri (Persero) Tbk and Bank Negara Indonesia (Persero) Tbk. The number of banks that quite healthy are still 17. But there is a change in which the Bank Tabungan Negara (Persero) Tbk which was quite healthy in the previous year (2014) became less healthy. This is because the value of NPM, ROA, and LDR of Bank Tabungan Negara (Persero) Tbk declined. The position of Bank Tabungan Negara (Persero) Tbk was replaced by Bank QNB Indonesia Tbk, which this year managed to increase the value of NPM, ROA, ROA and LDR so the level of health is quite healthy. Then in 2014, Bank MNC Internasional Tbk along with Bank Tabungan Negara (Persero) Tbk are the less healthy banks.

Based on the results of the research, only two banks in 2015 could maintain the health of the healthy category, namely Bank Central Asia Tbk and Bank Rakyat Indonesia (Persero) Tbk. Bank Negara Indonesia (Persero) Tbk and Bank Mandiri (Persero) Tbk has decreased NPL value and NPM value, which cause the soundness to go from healthy to be quite healthy. These two banks together with 14 other banks are in a quite healthy position, so that the number of banks that are quite healthy in 2015 was 16 banks. Then in 2015 the number of banks that are less healthy is the highest when compared to previous years, which was five banks. These banks are Bank QNB Indonesia Tbk, Bank CIMB Niaga Tbk, Bank Permata Tbk, Bank of India Indonesia Tbk and Bank Victoria International Tbk. These five banks are not able to maintain the value of their CAMEL.

Table 4. Bank Soundess by CAMEL Analysis

Year	Bank Soundness		
	Healthy	Quite Healthy	Less Healthy
2012	3	18	2
2013	4	17	2
2014	4	17	2
2105	2	16	5

Based on the analysis of the bank using the Z-Score during the year 2012 to 2015 as shown in Table 5 and Table 6, there was no bank with healthy soundness. In 2012, there were 13 banks that are in the grey area, meaning that the banks should pay more attention to the financial condition which can be improved so that it is more secure and can avoid potential bankruptcy. The data shows as many as 10 banks potentially face bankruptcy because of the Z-Score values that are less than 1,1. The banks facing a situation are Bank MNC Internasional Tbk, Bank Bukopin Tbk, Bank Negara Indonesia (Persero) Tbk, Bank Pembangunan Daerah Jawa Barat dan Banten Tbk, Bank Maybank Indonesia Tbk, Bank Sinar Mas Tbk, Bank Artha Graha Internasional Tbk, Bank Windu Kentjana Internasional Tbk, Bank NISP OCBC Tbk, dan Bank PAN Indonesia Tbk.

Table 5. Calculation of Z-score of the twenty-three bank in Indonesia, 2012-2015 period

Bank	Year	6,56 WC/TA	3,26 RE/TA	6,72 EBIT/TA	1,05 MVE/TL	Z-Score	Category
Bank Rakyat Indonesia Agroniaga Tbk	2012	0,9061	-0,0123	0,0856	0,1553	1,1348	Grey Zone
	2013	1,0492	0,0181	0,0938	0,2149	1,3760	Grey Zone
	2014	2,2619	0,0396	0,0861	0,1467	2,5344	Grey Zone
	2015	-0,1241	0,0593	0,0890	0,1667	0,1909	Potentially Bankrupt
Bank MNC Internasional Tbk	2012	0,1403	-0,0320	0,0054	0,1440	0,2577	Potentially Bankrupt
	2013	0,4998	-0,0618	-0,0548	0,1036	0,4868	Potentially Bankrupt
	2014	0,7447	-0,0723	-0,0499	0,1617	0,7842	Potentially Bankrupt
	2015	0,7908	-0,0540	0,0062	0,1348	0,8778	Potentially Bankrupt
Bank Central Asia Tbk	2012	0,0837	0,3351	0,2228	0,6039	1,2455	*Grey Zone*
	2013	0,1261	0,3628	0,2410	0,5739	1,3038	*Grey Zone*
	2014	0,4129	0,4016	0,2520	0,7146	1,7810	*Grey Zone*
	2015	0,7976	0,4497	0,2562	0,6859	2,1895	*Grey Zone*
Bank Bukopin Tbk	2012	0,1314	0,2473	0,1084	0,0841	0,5713	Potentially Bankrupt
	2013	0,6125	0,2923	0,1177	0,0876	1,1100	*Grey Zone*

Bank	Year	6,56 WC/TA	3,26 RE/TA	6,72 EBIT/TA	1,05 MVE/TL	Z-Score	Category
	2014	0,5660	0,2798	0,0764	0,0990	1,0214	Potentially Bankrupt
	2015	0,7198	0,2595	0,0839	0,0769	1,1401	*Grey Zone*
Bank Negara Indonesia (Persero) Tbk	2012	0,1742	0,1963	0,1794	0,2500	0,8000	Potentially Bankrupt
	2013	0,3339	0,2277	0,1960	0,2282	0,9859	Potentially Bankrupt
	2014	0,5349	0,2745	0,2182	0,3501	1,3777	*Grey Zone*
	2015	0,6480	0,2663	0,1515	0,2367	1,3025	*Grey Zone*
Bank Rakyat Indonesia (Persero) Tbk	2012	0,5576	0,3257	0,2908	0,3701	1,5442	*Grey Zone*
	2013	0,5701	0,3683	0,2996	0,3436	1,5816	*Grey Zone*
	2014	0,5859	0,3602	0,2581	0,4285	1,6327	*Grey Zone*
	2015	1,0153	0,3961	0,2486	0,3867	2,0467	*Grey Zone*
Bank Tabungan Negara (Persero) Tbk	2012	0,7444	0,0926	0,1120	0,1554	1,1045	*Grey Zone*
	2013	1,0896	0,1108	0,1097	0,0807	1,3909	*Grey Zone*
	2014	1,0517	0,1157	0,0734	0,1010	1,3418	*Grey Zone*
	2015	1,0512	0,1283	0,0994	0,0911	1,3700	*Grey Zone*
Bank Danamon Indonesia Tbk	2012	1,0838	0,3187	0,2367	0,4475	2,0867	*Grey Zone*
	2013	0,9001	0,3142	0,2017	0,2481	1,6641	*Grey Zone*
	2014	0,8174	0,3178	0,1219	0,2791	1,5362	*Grey Zone*
	2015	0,8021	0,3593	0,1173	0,2093	1,4881	*Grey Zone*
Bank Pembangunan Daerah Jawa Barat dan Banten Tbk	2012	-0,1956	0,1255	0,1435	0,1747	0,2481	Potentially Bankrupt
	2013	0,9862	0,1641	0,1660	0,1488	1,4650	*Grey Zone*
	2014	0,8430	0,1684	0,1261	0,1163	1,2538	*Grey Zone*
	2015	0,8093	0,1691	0,1338	0,1011	1,2133	*Grey Zone*
Bank QNB Indonesia Tbk	2012	0,9910	-0,0056	-0,0498	0,6824	1,6180	*Grey Zone*
	2013	0,8462	-0,0005	0,0031	0,3047	1,1535	*Grey Zone*
	2014	0,5963	0,0188	0,0525	0,2030	0,8706	Potentially Bankrupt
	2015	0,7609	0,0349	0,0545	0,1143	0,9646	Potentially Bankrupt
Bank Mandiri (Persero) Tbk	2012	0,4539	0,2363	0,2168	0,3820	1,2891	*Grey Zone*
	2013	0,6921	0,2652	0,2206	0,3223	1,5001	*Grey Zone*
	2014	0,6531	0,2823	0,2044	0,3550	1,4948	*Grey Zone*
	2015	0,7266	0,3196	0,1947	0,3078	1,5488	*Grey Zone*
Bank Bumi Arta Tbk	2012	0,7629	0,2625	0,1494	0,1352	1,3100	*Grey Zone*
	2013	0,7305	0,2598	0,1471	0,1094	1,2467	*Grey Zone*
	2014	0,6236	0,2277	0,0919	0,0842	1,0275	Potentially Bankrupt
	2015	0,5279	0,2006	0,0795	0,0864	0,8944	Potentially Bankrupt
Bank CIMB Niaga Tbk	2012	0,6446	0,2181	0,1970	0,1661	1,2258	*Grey Zone*
	2013	0,7853	0,2605	0,1791	0,1258	1,3507	*Grey Zone*
	2014	0,7888	0,2773	0,0922	0,1076	1,2660	*Grey Zone*
	2015	0,6223	0,2765	0,0160	0,0747	0,9896	Potentially Bankrupt
Bank Maybank Indonesia Tbk	2012	0,4634	0,1111	0,0984	0,2256	0,8985	Potentially Bankrupt
	2013	0,2169	0,1255	0,1044	0,1546	0,6015	Potentially Bankrupt
	2014	0,4610	0,1375	0,0456	0,1148	0,7589	Potentially Bankrupt
	2015	0,4857	0,1479	0,0621	0,0857	0,7815	Potentially Bankrupt
Bank Permata Tbk	2012	0,7951	0,3091	0,0963	0,1240	1,3245	*Grey Zone*
	2013	0,5783	0,2775	0,0933	0,1197	1,0687	*Grey Zone*
	2014	0,6328	0,3005	0,0742	0,1116	1,1190	*Grey Zone*
	2015	0,5994	0,3357	0,0108	0,0720	1,0179	Potentially Bankrupt
Bank Sinar Mas Tbk	2012	0,4482	0,1050	0,1266	0,1823	0,8622	Potentially Bankrupt
	2013	0,5822	0,1324	0,1102	0,2250	1,0498	Potentially Bankrupt
	2014	0,5580	0,1331	0,0635	0,2762	1,0308	Potentially Bankrupt
	2015	0,4606	0,1223	0,0576	0,2419	0,8825	Potentially Bankrupt
Bank of India Indonesia Tbk	2012	0,9826	0,2176	0,1955	0,6561	2,0518	*Grey Zone*
	2013	0,7778	0,2272	0,2044	0,1880	1,3974	*Grey Zone*
	2014	0,5983	0,2139	0,1839	0,2159	1,2119	*Grey Zone*
	2015	0,7819	0,1675	-0,0525	0,6589	1,5558	*Grey Zone*
Bank Victoria International Tbk	2012	0,7795	0,1609	0,1183	0,0624	1,1211	*Grey Zone*
	2013	0,7959	0,1651	0,1157	0,0481	1,5106	*Grey Zone*

Bank	Year	6,56	3,26	6,72	1,05	Z-Score	Category
		WC/TA	RE/TA	EBIT/TA	MVE/TL		
	2014	1,1240	0,1562	0,0382	0,7686	2,0870	*Grey Zone*
	2015	0,8972	0,1576	0,0272	0,7053	1,7872	*Grey Zone*
Bank Artha Graha Internasional Tbk	2012	0,6168	0,0100	0,0457	0,0537	0,7261	Potentially Bankrupt
	2013	0,7706	0,1107	0,0931	0,0672	1,0416	Potentially Bankrupt
	2014	0,6149	0,1143	0,0516	0,0001	0,7809	Potentially Bankrupt
	2015	0,4907	0,1165	0,0225	0,0393	0,6691	Potentially Bankrupt
Bank Mayapada Internasional Tbk	2012	0,2571	0,1069	0,1375	0,7204	1,2219	*Grey Zone*
	2013	0,5444	0,1065	0,1425	0,4639	1,2574	*Grey Zone*
	2014	0,4772	0,1083	0,1062	0,2055	0,8973	Potentially Bankrupt
	2015	0,5938	0,1270	0,1248	0,2063	1,0518	*Grey Zone*
Bank Windu Kentjana Internasional Tbk	2012	0,6835	0,0746	0,1324	0,1442	1,0347	Potentially Bankrupt
	2013	0,7986	0,0946	0,1008	0,1145	1,1085	*Grey Zone*
	2014	0,6722	0,0992	0,0492	0,1488	0,9694	Potentially Bankrupt
	2015	0,6646	0,1223	0,0643	0,2373	1,0885	*Grey Zone*
Bank NISP OCBC Tbk	2012	0,4072	0,1719	0,1038	0,1957	0,8785	Potentially Bankrupt
	2013	1,2011	0,1795	0,1054	0,1765	1,6625	*Grey Zone*
	2014	1,0209	0,2117	0,1158	0,1858	1,5342	*Grey Zone*
	2015	0,9506	0,2222	0,1116	0,1476	1,4320	*Grey Zone*
Bank PAN Indonesia Tbk	2012	0,4581	0,1992	0,1185	0,1215	0,8972	Potentially Bankrupt
	2013	0,8330	0,2551	0,1331	0,1154	1,3366	*Grey Zone*
	2014	0,8620	0,2873	0,1431	0,1970	1,4894	*Grey Zone*
	2015	0,8807	0,2959	0,0902	0,1362	1,4030	*Grey Zone*

Source: data calculated by researchers, 2016

In 2013, there are 5 banks that succeeded in increasing the value of Working Capital to Total Assets thus making the total value of the Z-Score higher and the number of banks that exist in the grey area amounts to 18 banks. The five banks are Bank Bukopin Tbk, Regional Development Bank of West Java and Banten Tbk, Bank Windu Kentjana International Tbk, Bank OCBC NISP Tbk and Bank PAN Indonesia TBK. In addition, the number of banks with strong bankruptcy potential this year decreased to 5.

In 2014, the number of banks that could become potentially bankrupt increased compared to the year 2013, which is nine banks. They are Bank MNC Internasional Tbk, Bank Bukopin Tbk, Bank QNB Indonesia Tbk, Bank Bumi Arta Tbk, Bank Maybank Indonesia Tbk, Bank Sinar Mas Tbk, Bank Artha Graha Internasional Tbk, Bank Mayapada International Tbk, and Bank Windu Kentjana International Tbk. So, the remaining 14 banks were in the grey zone.

For the year 2015 (shown in Table 5 and Table 6) the number of banks that could potentially become bankrupt is the same as in 2014, *i.e.* nine banks.

Table 6. Bank Soundness by Z-Score Analysis

Year	Bank Soundness		
	Healthy	Grey Zone	Potentially Bankrupt
2012	0	13	10
2013	0	18	5
2014	0	14	9
2105	0	14	9

But there are differences in the name of the banks that are listed in the potentially bankrupt category. The six banks that could potentially become bankrupt were Bank MNC Internasional Tbk, Bank QNB Indonesia Tbk, Bank Bumi Arta Tbk, Bank Maybank Indonesia Tbk, Bank Sinar Mas Tbk and Bank Artha Graha Internasional Tbk. Meanwhile, three other banks arein the grey zone: Bank Rakyat Indonesia Agroniaga Tbk, Bank CIMB Niaga Tbk and Bank Permata Tbk. Bank Rakyat Indonesia Agroniaga Tbk throughout the years of 2012-2014, but in 2015 the value of the Z-Score indicates that the bank has a potential bankruptcy. This is because in 2015, the value of Working Capital to Total Assets of bank is falling and negative. The soundness of bank CIMB Niaga Tbk and Bank Permata Tbk was also threatened and potentially powerful risk of bankruptcy because the value of EBIT to Total Assets and the value of the Market Value Equity to Total Liabilities of the two banks in 2015 decreased. From this, the number of banks that are in the grey zone in 2015 are 14 banks.

From Table 7 and Table 8, the research result by using Bankometer (S-Score) showed that during the year 2012 to 2015, all 23 banks in this study are healthy. This means that throughout the years 2012-2015, the banks are not experiencing financial difficulties or potential bankruptcy. This is because each bank can meet the criteria and maintain the component values associated with Bankometer and in accordance with the standards set by the International Monetary Fund (IMF). These values include the value of Capital to Asset Ratio should to be above 4%, the value of Equity to Asset Ratio should be more than 2%, the value of Capital Adequacy Ratio should be above 8%, the value of Non-Performing Loans of less than 15%, the value Cost to Income Ratio should be below 40%, and the value of Loans to Asset Ratio of less than 65%. Therefore, all 23 banks in this study meet the specified criteria and all the banks have a healthy soundness.

Table 7. Calculation results bankometer of the twenty-three bank in Indonesia, 2012-2015 Period

| Bank | Year | 1,5 | 1,2 | 3,5 | 0,6 | 0,3 | 0,4 | S-Score | Category |
		CA	EA	CAR	NPL	CI	LA		
Bank Rakyat Indonesia Agroniaga Tbk	2012	13,15%	11,05%	51,80%	0,94%	18,39%	24,14%	119,46%	Healthy
	2013	24,67%	19,44%	75,60%	0,55%	19,58%	28,08%	167,93%	Healthy
	2014	21,19%	16,81%	66,71%	0,79%	18,22%	28,76%	152,48%	Healthy
	2015	24,58%	19,40%	77,42%	0,79%	15,42%	28,28%	165,89%	Healthy
Bank MNC Internasional Tbk	2012	12,28%	11,52%	39,24%	2,39%	29,30%	27,14%	121,86%	Healthy
	2013	13,99%	11,28%	45,82%	1,42%	34,57%	26,35%	133,43%	Healthy
	2014	19,02%	15,69%	62,27%	2,32%	32,91%	26,00%	158,19%	Healthy
	2015	18,48%	16,89%	62,41%	1,46%	28,71%	23,23%	151,17%	Healthy
Bank Central Asia Tbk	2012	15,68%	14,06%	49,70%	0,12%	11,36%	22,82%	113,74%	Healthy
	2013	17,69%	15,05%	54,95%	0,12%	11,83%	24,69%	124,34%	Healthy
	2014	19,24%	16,43%	59,15%	0,12%	11,65%	24,58%	131,17%	Healthy
	2015	23,20%	18,09%	65,45%	0,12%	12,80%	25,48%	145,15%	Healthy
Bank Bukopin Tbk	2012	13,29%	9,13%	57,19%	0,94%	18,24%	27,15%	125,93%	Healthy
	2013	14,18%	10,79%	52,85%	0,94%	19,85%	27,45%	126,06%	Healthy
	2014	13,08%	10,33%	49,70%	1,24%	20,79%	27,50%	122,64%	Healthy
	2015	13,33%	9,58%	47,46%	1,28%	18,71%	27,49%	117,85%	Healthy
Bank Negara Indonesia (Persero) Tbk	2012	17,64%	15,67%	58,45%	0,48%	15,99%	23,26%	131,49%	Healthy
	2013	16,90%	14,80%	52,85%	0,30%	15,34%	25,93%	126,12%	Healthy
	2014	18,13%	17,58%	56,70%	0,24%	14,01%	25,99%	132,64%	Healthy
	2015	21,77%	18,51%	68,25%	0,54%	14,38%	24,70%	148,15%	Healthy
Bank Rakyat Indonesia (Persero) Tbk	2012	15,00%	14,12%	59,33%	0,20%	13,03%	24,38%	126,06%	Healthy
	2013	16,64%	15,25%	59,47%	0,19%	12,80%	26,78%	131,12%	Healthy
	2014	16,03%	14,62%	64,09%	0,22%	13,19%	23,90%	132,05%	Healthy
	2015	18,88%	15,45%	72,07%	0,31%	13,27%	24,92%	144,91%	Healthy
Bank Tabungan Negara (Persero) Tbk	2012	12,66%	11,04%	61,92%	1,87%	18,20%	26,71%	132,39%	Healthy
	2013	11,84%	10,61%	54,67%	1,82%	17,99%	27,87%	124,80%	Healthy
	2014	11,59%	10,17%	51,24%	1,66%	18,92%	29,02%	122,60%	Healthy
	2015	12,13%	9,68%	59,40%	1,27%	17,01%	29,34%	128,82%	Healthy
Bank Danamon Indonesia Tbk	2012	23,75%	22,13%	66,15%	0,12%	15,24%	23,34%	150,73%	Healthy
	2013	22,55%	20,55%	62,65%	0,66%	15,78%	22,46%	144,66%	Healthy
	2014	22,65%	20,01%	62,30%	0,78%	16,71%	21,81%	144,26%	Healthy
	2015	24,91%	21,83%	68,95%	1,14%	15,51%	21,16%	153,50%	Healthy
Bank Pembangunan Daerah Jawa Barat dan Banten	2012	9,68%	10,18%	63,39%	0,30%	19,32%	19,63%	122,49%	Healthy
	2013	11,29%	11,38%	57,79%	0,38%	19,97%	24,96%	125,77%	Healthy
	2014	11,39%	11,20%	56,28%	0,62%	21,43%	25,32%	126,24%	Healthy
	2015	11,41%	10,49%	55,48%	0,52%	20,20%	24,52%	122,60%	Healthy
Bank QNB Indonesia Tbk	2012	27,59%	22,30%	97,16%	0,19%	36,12%	27,29%	210,64%	Healthy
	2013	20,36%	16,31%	65,59%	0,06%	30,42%	29,67%	162,42%	Healthy
	2014	15,86%	13,04%	52,85%	0,14%	22,21%	28,97%	133,08%	Healthy
	2015	18,78%	11,29%	56,63%	1,44%	23,17%	32,28%	143,60%	Healthy
Bank Mandiri (Persero) Tbk	2012	14,62%	14,30%	54,18%	0,22%	13,64%	24,20%	121,17%	Healthy
	2013	15,01%	14,53%	52,26%	0,22%	12,88%	25,49%	120,39%	Healthy
	2014	15,00%	14,72%	58,10%	0,26%	14,14%	24,47%	126,70%	Healthy
	2015	17,70%	15,76%	65,10%	0,40%	13,53%	25,79%	138,27%	Healthy
	2012	18,47%	18,00%	67,13%	0,00%	19,77%	25,56%	148,93%	Healthy

| Bank | Year | 1,5 | 1,2 | 3,5 | 0,6 | 0,3 | 0,4 | S-Score | Category |
		CA	EA	CAR	NPL	CI	LA		
Bank Bumi Arta Tbk	2013	18,14%	16,74%	59,47%	0,00%	21,45%	27,89%	143,69%	Healthy
	2014	15,49%	14,02%	52,75%	0,05%	21,39%	27,38%	131,07%	Healthy
	2015	28,25%	22,55%	89,50%	0,23%	20,08%	26,15%	186,75%	Healthy
Bank CIMB Niaga Tbk	2012	17,75%	13,77%	53,06%	0,67%	14,62%	27,78%	127,65%	Healthy
	2013	18,42%	14,19%	53,76%	0,93%	15,29%	26,65%	129,25%	Healthy
	2014	19,06%	14,64%	54,53%	1,16%	15,98%	28,07%	133,45%	Healthy
	2015	19,03%	14,41%	56,98%	0,95%	17,63%	27,41%	136,42%	Healthy
Bank Maybank Indonesia Tbk	2012	15,09%	10,02%	44,91%	0,49%	14,77%	25,93%	111,19%	Healthy
	2013	15,33%	10,44%	44,59%	0,93%	13,04%	26,88%	111,21%	Healthy
	2014	19,03%	12,13%	55,16%	0,89%	19,18%	27,00%	133,39%	Healthy
	2015	17,16%	11,99%	53,10%	1,45%	20,67%	25,97%	130,33%	Healthy
Bank Permata Tbk	2012	19,12%	11,38%	55,51%	0,25%	20,85%	28,44%	135,54%	Healthy
	2013	16,72%	10,21%	50,05%	0,18%	20,61%	28,55%	126,33%	Healthy
	2014	16,05%	11,06%	47,60%	0,36%	16,96%	28,35%	120,38%	Healthy
	2015	17,83%	12,36%	52,50%	0,84%	15,73%	27,56%	126,82%	Healthy
Bank Sinar Mas Tbk	2012	17,72%	14,46%	63,32%	1,54%	11,54%	27,18%	135,75%	Healthy
	2013	22,68%	18,94%	76,37%	1,27%	12,69%	25,01%	156,96%	Healthy
	2014	21,00%	17,86%	64,33%	1,54%	13,98%	26,76%	145,48%	Healthy
	2015	17,49%	15,80%	50,30%	1,79%	14,85%	24,87%	125,10%	Healthy
Bank of India Indonesia Tbk	2012	20,17%	17,65%	73,85%	0,52%	12,75%	28,74%	153,68%	Healthy
	2013	17,14%	15,03%	53,41%	0,49%	9,63%	28,28%	123,98%	Healthy
	2014	14,52%	12,83%	53,87%	0,35%	8,70%	24,07%	114,34%	Healthy
	2015	22,13%	21,98%	83,48%	2,98%	8,81%	22,35%	161,71%	Healthy
Bank Victoria International Tbk	2012	18,57%	12,28%	62,86%	1,06%	13,30%	21,80%	129,87%	Healthy
	2013	18,35%	10,30%	62,83%	0,19%	13,85%	23,59%	129,11%	Healthy
	2014	17,39%	9,88%	64,23%	1,57%	23,39%	23,27%	139,73%	Healthy
	2015	17,47%	10,91%	67,55%	2,36%	25,03%	22,53%	145,84%	Healthy
Bank Artha Graha Internasional Tbk	2012	19,67%	11,31%	57,58%	0,48%	25,37%	29,60%	144,00%	Healthy
	2013	18,31%	14,65%	60,59%	1,06%	21,48%	28,96%	145,05%	Healthy
	2014	18,86%	13,76%	55,83%	1,01%	24,43%	29,01%	142,90%	Healthy
	2015	17,91%	13,21%	53,20%	0,75%	27,49%	27,25%	139,82%	Healthy
Bank Mayapada Internasional Tbk	2012	13,53%	12,90%	38,26%	1,28%	15,85%	28,47%	110,28%	Healthy
	2013	17,21%	11,87%	49,25%	0,38%	15,18%	29,44%	123,33%	Healthy
	2014	12,15%	9,22%	35,88%	0,88%	15,29%	28,74%	102,15%	Healthy
	2015	15,44%	11,64%	45,40%	1,36%	14,91%	28,95%	117,68%	Healthy
Bank Windu Kentjana Internasional Tbk	2012	16,61%	13,96%	48,51%	0,86%	20,22%	27,87%	128,03%	Healthy
	2013	18,31%	15,69%	51,38%	0,80%	20,22%	27,71%	134,11%	Healthy
	2014	17,69%	15,00%	49,53%	1,46%	23,56%	28,19%	135,42%	Healthy
	2015	20,56%	16,81%	57,37%	0,98%	22,00%	28,67%	146,39%	Healthy
Bank NISP OCBC Tbk	2012	18,71%	13,57%	57,72%	0,22%	17,12%	26,65%	134,00%	Healthy
	2013	21,96%	16,66%	67,48%	0,21%	16,54%	26,16%	149,01%	Healthy
	2014	22,35%	17,39%	65,59%	0,48%	16,64%	26,43%	148,88%	Healthy
	2015	21,77%	16,35%	60,62%	0,47%	16,03%	28,41%	143,65%	Healthy
Bank PAN Indonesia Tbk	2012	16,24%	12,27%	51,35%	0,29%	14,36%	21,24%	115,74%	Healthy
	2013	20,25%	14,29%	53,62%	0,45%	14,91%	25,11%	128,62%	Healthy
	2014	21,48%	16,03%	60,55%	0,31%	15,17%	25,94%	139,48%	Healthy
	2015	25,77%	20,19%	70,46%	0,33%	16,17%	25,72%	158,64%	Healthy

Source: data calculated by researchers, 2016

Table 8. Bank soundness by bankometer analysis

| Year | Bank Soundness | | |
	Healthy	Grey Zone	Potentially Bankrupt
2012	25	0	0
2013	25	0	0
2014	25	0	0
2105	25	0	0

After doing the calculations and analysis using each model, this study showed different results with each other. In addition, it was found that each analysis tool used in this study has advantages and disadvantages. Z-Score and Bankometer are easier to use because the calculation method is not complicated. Although Bankometer also uses ratios similar to CAMEL, it cannot replace the CAMEL in conducting soundness assessments. This is because Bankometer itself has not really become established as a legitimate tool that can be used in the assessment of the health of banks, especially in Indonesia. Although the results of the Z-Score are contrary to CAMEL, the tool is complementary to CAMEL analysis. Results of the Z-Score can be used to predict the financial distress and bankruptcy within a period of 1 to 3 years.

This study suggests using CAMEL to be the main analytical tool in assessing the health of banks. This is because CAMEL has been set by Bank Indonesia as an analytical tool in the procedure of assessment of the health of banks. So, the analysis of CAMEL already has clear rules and as such is a reference in the assessment of the health of banks in Indonesia.

Table 9. Strengths and Weaknesses of CAMEL, Z-score and Bankometer

	STRENGTHS	WEAKNESSES
CAMEL	▪ The concise tool in ensuring the condition of a bank. ▪ Used universally and already have a clear standard. ▪ Consists of five categories of assessment so more detail available to see the strengths and weaknesses of the bank.	▪ The calculations are too complex that it would be difficult for external parties perform accurate calculations.
Z-SCORE	▪ Using a standard financial ratio that is more easily understood and calculated. ▪ Able to show critical points in the bank. ▪ It has been used in the service industry, manufacturing, and banks to predict bankruptcy.	▪ The results can not accurately describe the bank's performance when compared to CAMEL.
BANKOMETER	▪ Ratio and the calculation stages are easier to count when compared with CAMEL. ▪ The ratio used is a combination of financial ratios and the ratio of CAMEL.	▪ Not widely known and has not been confirmed as a valid tool in analysing the health of banks, especially in Indonesia. ▪ Not widely used to assess the health and predict the bankruptcy of a bank.

Conclusion

Based on the analysis of CAMEL, banks that are always healthy throughout the years from 2012-2015 were only two banks, namely Bank Central Asia Tbk and Bank Rakyat Indonesia (Persero) Tbk. The soundness of the banking companies throughout the years 2012-2015 are dominated by banks that are quite healthy. It is hoped these banks can improve their health so that the Indonesian banking sector is dominated by banks that are healthy. Additionally, according to the results of the Z-Score, there was no sound bank throughout the year 2012-2015. Most banksused in the population sample entered a grey area and the results show there are several potential bankruptcies. Meanwhile, according to the results of the analysis from using the Bankometer model during the year 2012-2015, all banking is in a healthy position.

Each model analysis used shows different results. This is because every aspect in each model is also different. The research concluded that the main and reliable analytical tool that can be used to calculate the soundness of banks in Indonesia is CAMEL. This is because CAMEL has been set by Bank Indonesia and has clear rules so that results can be a generalized reference in the assessment of the health of banks in Indonesia.Z-Score analysis results can be used to supplement the results of CAMEL analysis; Bankometer still needs to be investigated further because it is not well established as a valid tool that can individually be used to assess the soundness of banks, especially those in Indonesia.

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