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IMPLEMENTING THE BANKING SECTOR SOUNDNESS INDEX (BSS) FOR PREDICTING BANKING CRISIS

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ABSTRACT

Bank is financial intermediary that play important role in the economy. Banks can't be separated from external and internal factors that can cause financial distress. This study aimed to examine the effect of economic growth, inflation, the ratio of money supply, Capital (CAR), Asset quality (LAR), Management (MAN), Earning (ROA), Liquidity (FDR), and Sensitivity to market risk (SEN) towards predictions Islamic banking crisis in ASEAN using Banking Sector Soundness Index (BSS). The samples in this study are 24 Islamic bank in ASEAN (Indonesia, Malaysia, the Philippines, and Thailand). The results showed that the macroeconomic variables are economic growth and the exchange rate have negatively effect, while the inflation rate and the ratio of the money supply have positively effect. For the bank's internal factors, variable asset quality (LAR) has negative effect to banking crisis.

Keywords: Crisis; Islamic banking; ASEAN; BSS Index.

INTRODUCTION:

Banks are financial intermediaries which play an important role in the economy. Lately, economic condition in ASEAN countries, on average, decreases compared with countries in the Europe and the United States. Data Outlook World Development Indicator (WDI), in 2015, there is a summary of the movement of the economic growth during 2009-2014. In 2010, the real income changes in both the countries of ASEAN, Europe and United States are both experiencing a decline, then fluctuate. However, in 2013, when the countries in the Europe and the US had increased, only the ASEAN countries were experiencing a decline. Economic activity in developed and developing countries in East Asia such as Korea, Taiwan, and ASEAN countries showed a slight economic slowdown than expected, this is reflected by weak exports and declining domestic demand.

The Early Warning System (EWS) crisis has done a lot of research by some experts for anticipation that the crisis could have been handled since the beginning of the emergence of indications of a crisis. EWS is using a variety of methods that are considered suitable for research. The aim of this paper is to anticipate the arrival of the crisis early so that the country can set up a variety of policies to reduce the impact of the crisis.

Bank Sharia remains more resistant to the crisis than conventional banks because Islamic banking system in the free activity of usury. Fahmi (2015; 43) defines usury is the addition in a way that is not fair. Conventional banks rated not support real growth in the overall economy because the real sector is considered to have a substantial risk, whereas if the money deposited in the bank it will benefit in the form of interest.

Based on the reason previously, we formulate the hypothesis as follows: whether economic growth, capital (CAR), asset quality (LAR) and earnings (ROA) exhibited negative effect, while inflation, the ratio of money supply, exchange rate, management (MAN), liquidity (FDR) and sensitivity to market Risk (SEN) exhibited positive effect towards the prediction of Islamic Banking crisis in ASEAN in 2010-2014.

LITERATURE REVIEW:

The Theory of crisis:

In the theory of the financial crisis, Ascarya (2009) mentioned that conventional economic generally looked a macro perspective, developed from the first generation model, the second generation model, and the third generation model.

- **First generation Model**

The model looked at the financial crisis which arise from a currency crisis or balance of payment crisis, macroeconomic imbalances because of weak economic fundamentals. This approach tends assuming central bank financing of fiscal deficit through the provision of credit in the country and also maintain a fixed exchange rate. This model can't explain the Asian financial crisis in which despite healthy economic fundamentals, these countries are still experiencing a crisis. This model was first proposed by Krugman (1979) and Flood and Garber (1984).

- **Second Generation Model**

This model was developed by the weakness of first generation model and propose the central role of expectations and a failure of coordination between lenders, so the crisis can occur regardless of the health of economic fundamentals. This model was first proposed by Obstfeld and Rogoff (1986).

- **Third Generation Model**

Krugman (1997) and Corsetti *et al.* (1998) stated that thereis influence of moral hazard on the third generation currency crisis. The third generation model emphasizes on the balance sheet effects associated with the devaluation. The basic idea is banks and companies in developing countries have explicit currency mismatches in their balance sheets as they do foreign currency loans and to lend in local currency. If there is a specific currency depreciation will lead therefore emphasizes the third generation model of banking supervision tightened.

Banking Crisis Definition:

Index Method developed by Kibritçioğlu (2002), who develop identification with the name of this crisis Banking Sector Fragility or BSF. BSF It has three main components of credit risk, liquidity risk and exchange rate risk. The formula of BSF as follows:

$$BSF = \frac{\left(\frac{Deposit_t - \mu_{deposit}}{\delta_{Deposit}}\right) + \left(\frac{Credit_t - \mu_{credit}}{\delta_{credit}}\right) + \left(\frac{FX\ debt_t - \mu_{FLeverage}}{\delta_{FLeverage}}\right)}{3} \quad \ldots\ldots\ldots\ldots\ldots\ldots(1)$$

Where:
Dep_t = Deposit in the banking
Credit = Credit of the banking sector
FX debt = Debt of the banking sector

While Bhattacharya and Roy (2009) has modified BSF Index and replaced foreign currency risk with the risk of domestic interest rates, Becomes a liquidity risk, credit risk and interest rate risk. Bhattacharya and Roy (2009) describes the interest rate risk are more prone to take the bank in a crisis situation. Banking sector health formula as follows:

$$BSS = \frac{\left(\frac{Deposit_t - \mu_{deposit}}{\delta_{Deposit}}\right)+\left(\frac{Credit_t - \mu_{credit}}{\delta_{credit}}\right)+\left(\frac{Investment_t - \mu_{Invenstment}}{\delta_{Investment}}\right)}{3} \quad \text{.....(2)}$$

where :

$Dep_t = ({}_rD_t - {}_rD_{t-12})/{}_rD_{t-12})$.....(3)

$Credit = ({}_rC_t - {}_rC_{t-12})/{}_rC_{t-12})$ .....(4)

$Investment = ({}_rI_t - {}_rI_{t-12})/{}_rI_{t-12})$ .....(5)

Bhattacharya and Roy (2009) argue that the banking crisis has a negative score on the index formula BSS. So BSS index value is binary. Banks have a crisis if the BSS ≤ 0 and the value is 1. The bank has a not crisis if it has a positive or BSS value> 0. This will have a value of 0 for the category of non-crisis.
BSS is suitable index is used to predict the Islamic banking crisis in ASEAN because there are three components used in Islamic banks, while the index BSF less appropriate when used to predict the Islamic banking crisis as one indicator does not exist in Islamic banks, namely the foreign debt.

Determinant of Banking Crisis:

Musdholifah (2015) found that low economic growth, indicate that economic activity both real sector and the financial sector will have an impact on the banking sector. This is supported by Demirgüç-Kunt and Detragiache (2005); Angkinand (2009); Shehzad dan Haan (2010); Wong *et al.* (2010); Roy and Kemme (2012); Buyukkarabacak and Valev (2012); Musdholifah *et al.* (2013); and Mahmood *et al.* (2014). But unlike Mannasoo and Mayes (2009); Poghasyan and Cihak (2009); Sahut and Mili (2011); and Papi *et al.* (2013) said that the real economic growth didn't affect the banking crisis.
Demirgüç-Kunt and Detragiache (2005) showed that macroeconomic factors that proxied by inflation variable positive effect on the banking crisis. Similar results were also expressed by Oktavilia (2008); Shahzad and Haan (2009); Wong *et al.* (2010); Musdholifah *et al.* (2013); and Mahmood *et al.* (2014). The different results found in the research Angkinand (2009); Mannasoo and Mayes (2009); Poghasyan and Cihak (2009); Sahut and Mili (2011); Buyukkarabacak and Valev (2012); and Papi *et al.* (2013) said that the inflation rate does not affect the prediction of the banking crisis. Musdholifah (2015) states inflation rate negatively effect of the banking crisis.
Demirgüç-Kunt and Detreagiache (2005); Oktavilia (2007); Wong *et al.* (2010); and Buyukkarabacak and Valev (2012) and Papi *et al.* (2013) found that the ratio of the money supply very positive effect on the financial and banking crisis, bad loans will rise due to the falling value of the currency that is, when the nonperforming Loan (NPL) the higher the risk of default customers also will increase. This condition will worsen the banking performance. However, in a study conducted by Roy and Kemme (2012); Musdholifah (2015) states that the ratio of the money supply.
Mahmood *et al.* (2014) further fluctuate up the exchange rate of a country the more it will invite the crisis. Oktavilia (2008); Shehzad and Haan (2009); Sahut and Mili (2011) showed that exchange rate have positive effect. However Demirgüç-Kunt and Detragiache (2005); Wong *et al.* (2010); Papi *et al.* (2013) stated the exchange rate of a country is no effect on the prediction of the banking crisis.
The effectiveness of risk weighted CAR use as a tool for predicting the banking crisis short-term (one-two years) so that the positive effect on the CAR crisis prediction by Boyacioglu *et al.* (2009); Mannasoo and Mayes (2009). Meanwhile, according to Monila (2002); Poghasyan and Cihak (2009); Almilia and Herdiningtyas (2005); Sahut and Mili (2011); Tatom (2011); and Musdholifah (2015) says that the CAR negatively affect the banking crisis. The lower propotion of capital compared to the total assets in the banking have the greater potential banking crisis. That was contras with the results of research Martharini dan Mahfud (2012) and Musdholifah (2013) states that the CAR does not affect the prediction of the banking crisis.
The quality of banking assets has positive influence on the predictions of the crisis (Poghasyan and Cihak 2009

and Tatom, 2011). Assets quality described in the non-performing loan ratio showed that the higher of the number of non perfoming loans, the banks have indicated that poor asset quality so that the probability of a crisis will be higher. Whereas, the opposite was the negative effect of asset quality that expressed by Mannasoo and Mayes (2009); Sahut and Mili (2011); and Musdholifah *et al.* (2013). But, Boyacioglu *et al.* (2009); Martharini dan Mahfud (2012); and Musdholifah (2015) stated that the quality of the asset does not affect the banking crisis.

Monila (2002); Sahut and Mili (2011); and Poghasyan and Cihak (2009) in their research report show that the management of banks negatively affect the banking crisis prediction, management ratios formulated with labor costs compared to total assets of the banking showed effectiveness in managing fund assets used in the existing workforce. The higher this ratio, the more ineffective use of the asset so that the probability of a crisis will be higher. While Tatom (2011) found positive effect on the banking management banking crisis prediction. However, research conducted by Boyacioglu *et al.* (2009); Martharini dan Mahfud (2012); Musdholifah *et al.* (2013); and Musdholifah (2015) states there is no influence between management and banking crisis.

Poghasyan and Cihak (2009) found that earnings had a negative effect on the banking crisis, ROA shows how big bank earnings before interest and taxes generated by compared bank to total assets, the greater this ratio, the probability of the occurrence of the crisis will be smaller, This is in line with research conducted by Monilia (2002); Martharini dan Mahfud (2012); Sahut and Mili (2011); Musdholifah *et al.*, (2013) and Tatom (2011). Whereas, according to Boyacioglu *et al.* (2009); Mannasoo and Mayes (2009) and Musdholifah (2015) say that earning no effect on prediction of the banking crisis.

Liquidity has a positive relationship, the higher the amount of credit extended by the bank, the higher the risk of default would occur so probability of crisis will be higher as well Boyacioglu *et al.* (2009); Sahut and Mili (2011); Musdholifah *et al.*, 2013). Liquidity is negatively by Monilia (2002) and supported by Tatom (2011) and Musdholifah (2015). Beside, according to Almilia and Herdiningtyas (2005); Poghasyan and Cihak (2009); Martharini dan Mahfud (2012); Roy and Kemme (2012) found no relationship between liquidity and banking crisis prediction.

The result of research of Musdholifah (2015) and Mahfud and Martharini (2010) said that sensitivity to market risk factors are not related to the banking crisis, while according Boyacioglu *et al.* (2009) and Musdholifah *et al.* (2013) reported a positive relationship with the banking crisis, it indicates that the banks more sensitive to the risks that exist in the market, the risk of the banking crisis will be even greater. Mahmood *et al.* (2014) states that there is a negative affect with the banking crisis.

METHODOLOGY:

This study uses quantitative research using this type descriptive. The population of this study are 34 banks, while samples were taken by purposive sampling method with the technique of determining the criteria that Islamic bank in ASEAN (Indonesia, Malaysia, Thailand and the Philippines) were to submit financial statements for 2009-2014. So, the number of samples of this research are 28 Islamic banks.

Variable and Data:

The data source secondary data in the form of documentation to the characteristics of the financial statements of the main report balance sheet and income / loss which is obtained through the website of each bank besides also the data of economic growth, inflation, the ratio of money supply, the exchange rate obtained from WDI and yahoo finance ,

Data analysis done using logistic analysis for data dependent variable is the banking crisis using BSS models to describe whether the bank would be predicted to occur a crisis or no crisis if predictable crisis given the number 1, if the bank does not predict the crisis given the number 0. To find out the effect of X on Y then do the following steps: 1) Identification of data outliers; 2) Assess the feasibility of regression models; 3) Assessing the influence of the model to the prediction crisis; 4) Testing the hypothesis.

FINDINGS AND DISCUSSION:

Statistical Result:

Measurements using BSS indexes banking crisis, banks have a crisis if the BSS ≤ 0 and the value is 1. The bank has a not crisis if it has a positive or BSS value> 0. This will have a value of 0 for the category of non-crisis.

Table 1. Result of BSS index

No.	Banks	BSS Index	Score	BSS Index	Score	BSS Index	Score	BSS Index	Score	BSS Index	Score
		2010	2010	2011	2011	2012	2012	2013	2013	2014	2014
1	Bank Muamalat Indonesia	0.21	0	1.19	0	3.44	0	-0.45	1	1.84	0
2	Bank Rakyat Indonesia Syariah	1.3	0	0.19	0	-0.29	1	-0.07	1	0.83	0
3	Bank Syariah Mandiri	-0.02	1	-0.56	1	-0.5	1	-0.71	1	-1.13	1
4	Bank Mega Syariah	-0.78	1	-2.16	1	-1.45	1	-1.89	1	-1.29	1
5	Bank Panin Syariah	-1.48	1	0.54	0	8.84	0	0.85	0	2.39	0
6	Bank Syariah Bukopin	-0.7	1	0	0	1.33	0	0.48	0	-0.49	1
7	Bank Central Asia Syariah	-1.28	1	-0.12	1	1.1	0	-0.44	1	-0.54	1
8	Al-Amanah Bank of the Philippines	2.08	0	-0.77	1	-0.92	1	-0.77	1	-0.79	1
9	Islamic Bank of Thailand	0.72	0	-0.66	1	-0.88	1	-1.52	1	-1.46	1
10	Affin Islamic Bank Berhad	-0.01	1	-0.68	1	2.24	0	-0.24	1	-0.2	1
11	Al Rajhi Banking and Investment Corporation BHD	0.4	0	-0.03	1	-0.35	1	0.89	0	-0.37	1
12	Alliance Holdings Berhad	0.34	0	0.24	0	0.6	0	-0.33	1	-0.37	1
13	Bank Muamalat Malaysia	-0.6	1	-0.14	1	-0.13	1	-0.67	1	-0.76	1
14	AMMB Holdings Berhad	-0.41	1	-0.59	1	1.05	0	-0.34	1	0.05	0
15	Bank Islam Malaysia Berhad	-0.11	1	-0.1	1	-0.14	1	-0.37	1	-0.19	1
16	Hong Leong Islamic Bank Berhad	0.42	0	-0.18	1	2.09	0	-0.22	1	-0.27	1
17	CIMB Group Holding Berhad	-0.28	1	-0.29	1	-0.41	1	-0.24	1	-0.09	1
18	HSBC Amanah Malaysia Berhad	0.53	0	0.31	0	0.83	0	-1.47	1	8.08	0
19	Kuwait Finance House (Malaysia) Berhad	-0.67	1	-0.62	1	-0.12	1	-0.41	1	-0.62	1
20	OCBC Al-Amin Bank Berhad	-0.83	1	0.54	0	-0.8	1	-0.98	1	44.42	0
21	Asean Finance Bank	-0.13	1	0.02	0	0.4	0	-0.75	1	-0.7	1
22	Maybank Malaysia	-1.11	1	2.05	0	6.36	0	-1.07	1	-0.1	1
23	RHB Islamic Bank	0.8	0	0.06	0	0.1	0	-0.12	1	-1	1
24	Standart Chartered Saadiq Berhad	1.42	0	-0.19	1	-0.24	1	-0.34	1	1.97	0

Source: researcher statistical analysis

The results of logistic analysis in Table 2, showing that the value Negelkerke R square is 45%, which means that the independent variable can explain the prediction of as much as 45% of the banking crisis. The value of the overall percentage describes the amount and accuracy of the crisis is not a crisis that is 72%. Homer and Lemeshow the significant value of the test is greater than 10%, which means that the model fit the data.

Table 2: The Result of Statistic model

Variables in the Equation							
		B	S.E.	Wald	df	Sig.	Exp(B)
Step 6[a]	GDP	-.588	.357	2.714	1	.099	.555
	Inflation	.202	.097	4.371	1	.037	1.224
	M2	2.983	.940	10.071	1	.002	19.742
	Exchange Rate	-.001	.000	20.267	1	.000	.999
	LAR	-3.890	1.568	6.151	1	.013	.020
	Constant	-.781	3.369	.054	1	.817	.458
Negelkerke R Square : 45%							
Overall Percentage : 72%							
Hosmer and Lemeshow test Chi-quare: 5,512 Sign: 0,702							

Source: statistical analysis

$$\text{Crisis Model} = -0{,}781 - 0{,}588\ \text{GDP} + 0{,}202\ \text{Inflation} + 2{,}983\ \text{M2} - 0{,}001\ \text{Exchange Rate} - 3{,}890\ \text{LAR} + e$$

DISCUSSION:

Economic growth (GDP) forecast negative effect on the crisis over the study period 2010-2014 showed that the lower economic growth the higher the probability of a crisis, when real economic growth declining, production activities would be hampered society so that people will have difficulty in recovering credits received from banks, as a result NPF will be increased, the likelihood of a crisis will increase as well (Demirgüç-Kunt and Detragiache, 2005; Angkinand 2007; Shehzad and Haan, 2010; Wong *et al.*, 2010; Roy and Kemme, 2012; Buyukkarabacak and Valev, 2012; Musdholifah *et al.*, 2013; Mahmood *et al.*, 2014; and Musdholifah, 2015).

Inflation has positive influence on the banking crisis prediction, Demirgüç-Kunt and Detragiache (2005) explains that there is a positive relationship between inflation and the crisis among banks. Due to the condition of inflation experienced by some countries would lead to the condition of a currency devaluation that would occur banks total outstanding loans, if loans are declining, banks' interest income will decrease, the probability of a crisis will increase. Oktavilia (2008) and Musdholifah *et al.* (2013) in his study said the economic problems Indonesia during the crisis period, which begins on public confidence in the bank decreased so that the rupiah weakens, so that inflation rose sharply, this condition will lead to lower interest rates to rise, when interest rates increased then the rate of return on loans decreased, the number of problem loans increased which brings banking conditions worsen. It is also supported by Shahzad and Haan (2009); Wong *et al.* (2010); Musdholifah *et al.* (2013).

Demirgüç-Kunt and Detreagiache (2005) states that the ratio of the money supply has positive effect on the financial crisis and banks, bad loans will rise due to the falling value of the currency that is, when the nonperforming loan (NPL) increased, then the higher the risk of default of customers will also increase. This condition will worsen the banking performance. It is also supported by research conducted by Oktavilia (2008); Shahzad and Haan (2009); Wong *et al.* (2010); Buyukkarabacak and Valev (2012); Musdholifah *et al.* (2013); Mahmood *et al.* (2014).

Exchange rates negatively affect the prediction of Islamic banking crisis, higher exchange rate, there will be a currency devaluation that led to the social demand for liquid money increased, causing a preference for the basic needs of greater than repay the loan at the bank. These conditions resulted in increased ownership in the bad loans, predicted the crisis will also increase. This is supported by research conducted by Mahmood *et al.* (2014) states that the exchange rate negatively affect the banking crisis, any currency fluctuations will invite the banking crisis.

Variable capital does not significantly associated with the prediction of the crisis, these results are not within the second generation crisis theory that says the crisis could emerge in the fundamental good state, in other words that the bank's internal factors that lead to a currency crisis that occurred. These results are supported by research conducted by Martharini and the Mahfud (2010) and Musdholifah (2013).

Variable asset quality proxy by the ratio LAR negatively affect predictions Islamic banking crisis in ASEAN, LAR ratio hike will lead to the probability of a banking crisis will be even lower. High ratio of disbursed financing shows that the higher it is for that that would be obtained by the Islamic banking, so the profit received will be higher. Musdholifah *et al.* (2013) describes as a high quality bank assets, the amount of nonperforming loans is low so the potential of the banking crisis will be smaller. Besides finding is also supported by the results of research Mannasoo and Mayes (2009), Sahut and Mili (2011), Poghosyan and Cihak (2009).

Variable management did not significantly affect ASEAN Islamic banking crisis because of the size of the level of achievement of success or failure of a bank management not provide results that affect the possibility of a crisis. This is consistent with the results of research Boyacioglu *et al.* (2009); And Mahfud Martharini (2010); Musdholifah *et al.* (2013); and Musdholifah (2015).

Variable earnings are proxied by the ROA does not affect the prediction of the crisis because of high asset does not guarantee banks can survive to the crisis. These results are supported by the results of this study are also supported by research conducted by Boyacioglu *et al.* (2009); Mannasoo and Mayes (2009) and Musdholifah (2015).

Variable liquidity proxied by the ratio of FDR did not affect the prediction of the crisis because in this study the extent of the loan has no significantly effect on the condition of the banking difficulties. These results are supported by a study Almilia and Herdiningtyas (2005); Poghasyan and Cihak (2009); Martharini dan Mahfud (2012).

Variable sensitivity to market risk does not affect the ASEAN Islamic banking crisis. It is not appropriate to the research conducted by Mahmood *et al.* (2014) and Boyacioglu *et al.* (2009) showed that the ratio is a positive influence on the banking crisis means that the greater the ratio of sensitivity to market risk, the greater the likelihood of a banking crisis. When securities are bought and sold more than showed economic conditions getting better, so the bank will be even further away from the conditions of bankruptcy.

CONCLUSION:

The results showed that the macroeconomic variables namely economic growth and exchange rate have negative effect to banking crisis. When, the economic growth of a country are declining, communities will be hampered production activities that would cause bad loans increased, while bad loans increases, the probability of the occurrence of the crisis will be higher. For the exchange rate, when the exchange rate of USD strengthened against the currencies of the ASEAN countries, the ASEAN countries money demand will decrease the financing disbursed banks will be decreased so that the probability of a crisis will increase. While, the inflation and the ratio of the money supply have positive effect. When, inflation increases the need for cash by the public will increase as well, so that bank deposits will decrease which will cause the amount of financing provided will be reduced. When financing decreased for the results obtained then banks will fall so that the probability of a crisis will increase. When, the money supply in a high state will cause currency speculation by investors, so that local investments will be transferred to foreign investment . This will result in securities being sold banks will be decreased so that the bank's income earned from these securities will decline, the higher the probability of crisis. For the bank's internal factors, variable quality assets (LAR) negative affect predictive crisis because the higher financing channeled cause NPF increased so that the probability of the occurrence of the crisis will be higher.

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APENDIX:

Table 3: Operational Definition of Variable

N	Variable	Formulation	Literature Source	Data Source
1.	Prediction Crisis	$BSS = \frac{\left(\frac{Deposit_t - \mu_{deposit}}{\delta_{Deposit}}\right) + \left(\frac{Credit_t - \mu_{credit}}{\delta_{credit}}\right) + \left(\frac{Invest_t - \mu_{Invet}}{\delta_{Investment}}\right)}{3}$ Where: Deposit = $({}_rD_t - {}_rD_{t-12})/{}_rD_{t-12}$) Credit = $({}_rC_t - {}_rC_{t-12})/{}_rC_{t-12}$) Investment = $({}_rI_t - {}_rI_{t-12})/{}_rI_{t-12}$)	Wong *et al.*, 2010; Musdholifah, 2015	Each bank web
2.	GDP	The annual percentage change of real GDP	Wong *et al.*, 2010; Musdholifah, 2015	World Bank, WDI (World Development Indicator)
3.	Inflation	The annual percentage change of real deflator	Wong *et al.*, 2010	World Bank, WDI (World Development Indicator)

N	Variable	Formulation	Literature Source	Data Source
4.	Rasio of money suplay	$Rasio\ M2 = \frac{Rasio\ M2}{Foreign\ exchange\ reserve\ the\ central\ bank}\ x\ 100\%$	Wong *et al.*, 2010	World Bank, WDI (World Development Indicator)
5.	Exchange rate	Exchange rate USD to each country	Sahut and Mili, 2011	Yahoo Finance
6.	Capital	$CAR = \frac{Shareholder\ equity}{Total\ asset}\ x\ 100\%$	Boyacioglu *et al.*, 2009 and Musdholifah, 2015	Each bank web
7.	Asset Quality	$LAR = \frac{Total\ Financing}{Total\ asset}\ x\ 100\%$	Boyacioglu *et al.*, 2009 and Musdholifah, 2015	Each bank web
8.	Manageme nt	$MAN = \frac{Labour\ Cost}{Total\ Asset} x\ 100\%$	Boyacioglu *et al.*, 2009 and Musdholifah, 2015	Each bank web
9.	Earning	$ROA = \frac{EBIT}{Total\ Asset} x\ 100\%$	Boyacioglu *et al.*, 2009 and Musdholifah, 2015	Each bank web
10.	Liquidity	$FDR = \frac{Total\ Financing}{Total\ Deposit} x\ 100\%$	Boyacioglu *et al.*, 2009 andMusdholif ah, 2015	Each bank web
11.	Sensitivity to market risk	$SEN = \frac{Trading\ Securities}{Total\ Asset} x\ 100\%$	Boyacioglu *et al.*, 2009	Each bank web

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