Measuring Risk: Is IT Necessary? An Empirical Study in Indonesian Banks

Review of Integrative Business & Economics Research

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ABSTRACT

Banks' fundamental concept relies on public trust. Since banks are also called the fiduciary financial institutions, public trust plays as an important role in the banking industry. This is mainly due to the fact that banks do not actually manage their own money. Instead, banks manage public money. This may appear as the basic reasons on why banks are heavily controlled, and regulated by the government. Enforcements and necessary revisions should be done cautiously, as a result. Aside from regular monitoring and maintaining of the public trusts, banks are also managing the circulation of money. The process of granting loans, for instance, may have to be carefully monitored as well, to prevent non-payment of loans.

For this reason, this study attempts to analyze the management of risk in Indonesian banks, relying particularly from the commonly-prescribed indicators, such as; market risk, credit risk, and operational risk. These sets of indicators are analyzed to note the relational stimulus toward performance of publicly-listed banks in Indonesian Stock Exchange, or otherwise known as Bursa Efek Indonesia ("BEI"). It is expected that as banks are able to better manage their risks, performance swells.

Keywords: risk management, market risk, credit risk, operational risk, Indonesia, bank

I. INTRODUCTION

The most fundamental concept in the banking industry around the world is undoubtedly the level of public trust. Public trust plays as an important role in the banking industry (www.bbc.co.uk, 2009). The banks will face a difficult time and may collapse if the public start losing its trusts toward banks and/or financial institutions, in general. Other than a fiduciary role, banks also take-on a mediator role to become the institution in-between those who have excess funds (depositors), and those who are in-need of funds (creditors). Hence, since banks basically manage the society's money, this is the main reason why banks and financial institutions are heavily controlled, monitored, and regulated by the government. Enforcements and revisions are frequently performed to maintain public trusts toward banks and financial institutions (Koch and MacDonald, 2009).

In relation to the strict control on banks and financial institutions, it is not a surprise if The Global Association of Risk Professional (GARP) states that risk management as a set of controlling guidelines. In fact, risk management has also earned its importance for the banks and financial institutions. For this reason, it becomes fascinating to actually note the risk management and its association toward performance of banks. Generally, there are 3 main elements of risk management; market risk, credit risk, and operational risk. Concerning the intended scope of research, some guidance and regulations on Indonesian banks are worth noted to provide sufficient supports in analyzing risk management and performance of banks. Some of those guidance and regulations are as follows;

1. Circulation Letter of Bank Indonesia No.11/3/DPNP, dated January 27, 2009 stated that banks in Indonesia, with a specific qualification, are required to calculate their operational risk in accordance with the calculations of capital adequacy ratio (CAR). It is mandatory for all banks to fulfill a minimum CAR of 8% based on banks' operational risk.
2. Regulation of Bank Indonesia No. 9/13/PBI/2007, dated November 1, 2007 stated that banks in Indonesia, with a specific qualification, are required to calculate their market risk in accordance with the calculations of CAR. It is mandatory for all banks to fulfill a minimum CAR of 8% based on banks' market risk.
3. Regulation of Bank Indonesia No. 8/6/PBI/2006, dated January 30, 2006, and the Circulation Letter of Bank Indonesia No. 8/27/DPNP, dated November 27, 2006, mentioned that it is mandatory for all banks to fulfill CAR individually, yet consolidated.

Therefore, the study of risk management is expected to balance outcomes and cost so companies can reach better performance over time. With this consideration, this research attempts to investigate the relationship between profitability ratio and market risk, credit risk, and operational risk in publicly-traded banks in Indonesia.

II. LITERATURE REVIEW

Everyday in our daily life opportunities and risks always exist, both positive and negative results. People know that risk is always involved in everything they do, no matter how big or small the risk is. As a human or person, someone must have known that every single thing he does is risky, even in driving a car or bike, and any other simple and casual things in daily life. Although people know that everything is risky, accepting the different level of risks by thinking that if the activities are done carefully, the chance of failure or something pernicious is low. The probability of what is not wanted to be happening and its consequences needs to be accounted when evaluating risk.

II.1. RISK

According to Fraser (2010), stated that risk is usually connected as a result of what will happen in the future, such as opportunities, probability, and the aftermath of today's decision. In addition, according to oxforddictionaries.com, the word risk as a noun was described as any circumstances that will result to danger. This is explaining why Evans, et al (2010) stated that risk is generally seen of something that goes wrong, as it is the opportunity of failure or disaster. However, it is also stated in his research that risk is not only about negative effects but also positive effects, which is called opportunities, opportunities to create something better than today. Risk exists due to the shortfall of an achievement, for instance, during a failure to create a higher market share when there is launch of a new product. Therefore, in order to avoid or at least minimize risk, risk management should be applied in order to have ways of improving performance, and to go way far than what is done today not just simply actions of handling negative opportunities and results. In other words, what is meant by risk explained by Evans, et al (2010) is that risk is a shortfall in comparison with the actual performance and desired performance at some particular time in the future.

II.2. RISK MANAGEMENT

According to Taures (2011), risk was once regarded as a possibility of the occurrence of adverse effect or adverse consequences. However, risks is now associated with positive and negative uncertainties. Risk is the situation where there is an uncertainty over the impact that will happen, whether it will give advantages or disadvantages. The study of risk management has becoming a well-known debated topic in the world of financial research McShane (2010). Risk management was thought as something that is irrelevant in the circumstances of perfect

market conditions, as the topic still continues until today and the effectiveness of risk management is now being studied and investigated.

II.3. TYPES OF RISK

As an entity, institution needs to be aware with the importance of managing risks. Stated by Singh (2011), financial institutions such as banks will always be challenged with the management of risks; therefore it is important to be consistently usual with the terminology of risk. The thought of banking industry risk is not only about credit risk management and market risk management as the two main types of risk. There's another type of risk management needs to be considered, which is operational risk that will also be discussed further in this study.

II.3.1. MARKET RISK

Market means a mechanism when buyers and sellers interact to determine the price and quantity of a product, which either a good or service. Previous researches of similar studies once described market risk as, first, a theory about market risk is done by Fraser (2010), Market risk is a risk that changes in accordance with the situations in the market; such as, interest rates, exchange rates, commodity prices and stock prices.

Not only explaining about the understanding of market risk, Fraser (2010) further explained about its indicators, which are, (1) currency risk, which refers to risk that varies in accordance with changes of exchange rates, (2) interest rate risk, which occurs parallel to changes in interest rates, (3) commodity price risk, which occurs due to changes in the commodity prices, (4) equity price risk, which is expected in accordance with operating strategy of companies due to changes in equity prices, (5) economic risk is, which refers to changes in companies' cash flows due to GDP growth, consumer confidence, or consumer purchasing power, for instance.

II.3.2. CREDIT RISK

Credit is often interpreted by installments paid in the future, as per mutual agreement between parties. With this relatively simple notion, though credit can take various forms, usually it is in the form of installments. As a financial institution whose job is to provide services to the society, bank not only acts as a place where people can save money and keep their savings. Bank also has the authority at which banks can extend credit to customers who need, either to start a business, mortgage, and other customer needs. However, after the bank decided to lend to customers, banks should create a guideline to determine which customers that will be allowed to buy on credit and which customers who will not be allowed to but on credit. From all the customers, there is always a possibility whether it is a strong or low possibility that bank's customers someday in the future cannot fulfill what they are oblige to pay, such as their loans. Therefore, before it happens banks need to consider its credit risk.

More information from Fraser (2010), combined with information gathered at encycopediacredit.com (2011) and Ross, et al (2008), the fundamental method to assess company's creditworthiness is to analyze five principles of credit analysis called The 5 C's, which are; (1) character: the willingness of customers in meeting their obligations, (2) capacity: the ability of customers to fulfill their obligations, (3) capital: financial reserves of the customers, (4) collateral: asset to be pledged in a particular case, and (5) conditions: economic condition of customer's area of business.

II.3.3. OPERATIONAL RISK

According to Saunders and Cornett (2006), operational risk is the risk that technology, auditing, monitoring, and other support systems may malfunction or break down. One quote stated by (www.pwc.com, 2012), *"The risk of loss resulting from inadequate or failed internal process, people and systems, or from external events. As such, operational risk captures business continuity plans, environmental risk, crisis management, process systems and operation risk, people related risks and health and safety, and information technology risks."* Another operational risk theory, according to (www.mckinseyquarterly.com, 2011), operational risk is the exposure of financial institutions to losses, which arises from non-financial mistakes such as human risk due to human error. Financial institutions usually calculate their operational risk by measuring and estimating the chance of a particular event that will result in financial losses.

II.4. PROFITABILITY RATIO

II.4.1. RETURN ON ASSET

Described by beginnersinvest.about.com (2012) that return on assets is also known as ROA for short. How profitable of a company where in this study is grouped as banks, can be measured using this ratio. How much profit banks will generate for each Rp 1 in assets that the company owns. ROA calculates the measurement of asset intensity and shows how good a business is. According to Ross, et al (2008), the most common formula to calculate ROA is;

ROA = Net Income/Total Assets..... (2.1)

II.4.2. RETURN ON EQUITY

According to www.beginnersinvest.about.com (2012), information about another ratio to measure company's profitability known as ROE. It is stated that ROE is one of the most important ratio to measure profitability of a company. ROE shows how much profit that a company could earn compared to the total amount of shareholder equity within the company that is stated in the balance sheet.

Shareholder's Equity = Total Assets – Total Liabilities..... (2.2)

This equation describes that the result of deduction between assets and liabilities will show what the shareholders own. According to Ross, et al (2008), ROE is used to measure how the stockholders are charged within one year. ROE is one of the bottom line measurers to calculate company's performance because it is the company's objective to give benefits to the shareholders. The formula to calculate ROE is as follows:

ROE = Net Income/Total Equity..... (2.3)

II.4.3. NON-PERFORMING LOAN

According Hendri (2009), non-performing loan is one of the key indicators to assess the performance of functions of the bank. It is the duty of bank as an intermediary or liaison agency between the parties that have excess funds to those who need funds. A bank's biggest earnings come from interest income on loans and civic largest source of funding also comes from a community bank or third party funds, so that the community fund raising activities that have excess funds and then distribute these funds in the form of civic re-credit an activity or a major function of a bank. Loans are not at risk of failure rather than civic or jammed. The Indonesian central bank known as Bank Indonesia (BI), through the regulations of Bank Indonesia, state that the ratio of non-performing loans (NPLs) amounted to 5%. NPL calculation formula is as follows:

NPL = Total Non-Performing Loan/Total Loans ..... (2.4)

II.4.4. CAPITAL ADEQUACY RATIO

According to Ginanjar (2007), the central bank in Indonesia, Bank Indonesia, as the mentor and supervisor of other banks in Indonesia must adapt to the development of international banking for national banks to set up a bank that is ready to compete. Indonesia is also the bank issued a regulation on capital adequacy that can be set as a requirement for banks in managing their capital without ignoring the risk. Accordance with the international settlement, the bank Indonesia requires banks to provide a capital minimum of 8% since December 1993, after the monetary crisis adapted to the conditions.

Capital Adequacy Ratio = (Tier 1 Capital + Tier 2 Capital)/Risk Weighted Assets ..... (2.5)

II.4.5. NET INTEREST MARGIN

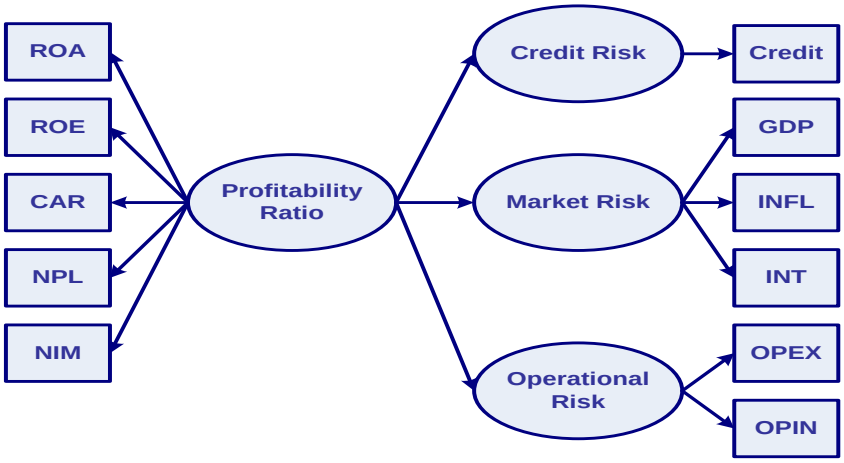
According to Kunt and Huizinga (2000), net interest margin (NIM) can be considered as one of several ways to measure banks' profitability and measure inefficiency of banking system. Additional supports are mentioned by Saragih (2012) stated that NIM is not just reflecting the market risk due to fluctuations in market conditions, where those fluctuations may potentially harm the performance of bank, but also measuring the ability of bank management in generating interest income. The higher the ratio, the higher interest income for the bank. NIM is calculated using the following formula:

NIM = (Interest Income – Interest Expense)/Average Earning Assets ..... (2.6)

II.5. RESEARCH MODEL

To follow up the literature review, the following is the research model in this study, which attempts to note the relationship between profitability ratio and the risk management in banks.

Illustration 1: Research Model



The illustration above describes the research model of this study. On the left, profitability ratio is stated as the independent variable in this research, and multiple risk factors are the dependent variables. Profitability ratios used for this research are return on assets ratio, return on equity ratios, capital adequacy ratios, non-performing loans ratios, and net interest margin ratios of banks. However, to support the risk management as the Y factor, information is gathered from total loans or total credit given of credit risk indicator, gross

domestic product, inflation and interest rates to support market risk indicators, and operating expense and operating income to fulfill operational risk indicators.

III. RESEARCH METHOD

The primary purpose of this research paper is to study the important role of risk management in Indonesian banks. This study follows the notion of exploratory and descriptive research approach to clarify and define the issues, including drawing the necessary phenomenon and characteristics of the issues (Zikmund, 2003).

According to Jakarta Stock Exchange Industrial Classification (JASICA), there are 9 categories of industries in Indonesia, as shown in the following table.

Table 1: Indonesia's Industrial Classifications

No.	List of Industries in Indonesia
1.	Agriculture
2.	Mining
3.	Basic Industry and Chemicals
4.	Miscellaneous Industry
5.	Consumer Goods Industry
6.	Property and Real Estate
7.	Infrastructures, Utilities and Transportation
8.	Finance
9.	Trade, Service and Investments

Source: Indonesia's Stock Exchange, 2012

Within those 9 industrial categories, banks are listed as a sub-sector in finance industry, as detailed in the following table.

Table 2: List of Sub-Sectors in Finance Industry

Population	Number of Samples
Total Industries	9
Finance Industry	71
Sub Sector – Financial Institutions	13
Sub Sector – Securities	9
Sub Sector – Insurance	11
Sub Sector – Others	7
Sub Sector – Bank	31

Source: Indonesia's Stock Exchange, 2011

The above table shows the total number of samples that are grouped in sub-sectors within the finance industry. There are 71 listed companies in the finance industry classification; 13 out of 71 companies are listed as financial institutions, 9 out of 71 listed as securities companies, 11 out of 71 listed in the insurance sub sector industry, 7 out of 71 stated other sub sector of industry, and finally there are 31 banks out of 71 companies stated as publicly listed companies in Indonesia's Stock Exchange. From those 31 listed banks, there are only 19 banks which are conforming to the prescribed criteria in this study, which mainly covers six years periods from the year 2005 until 2010. The following table shows the 19 banks used in this study.

Table 3: List of 19 Publicly-Listed Banks

No.	Code:	Banks:
1.	BBCA	Bank Central Asia
2.	BBNI	Bank Negara Indonesia
3.	BBNP	Bank Nusantara Parahyangan
4.	BSWD	Bank Swadesi
5.	BDMN	Bank Danamon
6.	BEKS	Bank Eksekutif
7.	BNGA	Bank Niaga
8.	BNII	Bank International Indonesia
9.	BNLI	Bank Permata
10.	BMRI	Bank Mandiri
11.	INPC	Bank Artha Graha Internasional
12.	MAYA	Bank Mayapada
13.	MEGA	Bank Mega
14.	NISP	Bank Nilai Inti Sari Penyimpan
15.	PNBN	Bank PAN Indonesia
16.	BABP	Bank ICB Bumiputera
17.	BBTN	Bank Tabungan Negara
18.	BKSW	Bank Kesawan
19.	BBRI	Bank Rakyat Indonesia

Source: Indonesia's Stock Exchange, 2012

III.1. RESEARCH PROCESS

The research process begins with data collection, which is based on secondary data in analyzing the financial data. The collected secondary data are particularly sourced out from the annual reports and financial statements of publicly-traded Indonesian banks at BEI, books, dictionaries, journal articles, companies' websites, newspapers, and Indonesia's stock exchange website (www.idx.co.id, 2005-2010).

Table 1: Details on Variables

Variable	Indicator
Risk Management Risk management refers to several coordinated activities to control companies in avoiding and minimizing potential risks. By so doing, it is expected to reduce operational costs (Lewis, 2010; McShane, 2010).	Market risk (Singh, 2010; Fraser, 2008; McShane, 2011; Lewis, 2010)
	Credit risk (Singh, 2010; Fraser, 2008; McShane, 2011; Lewis, 2010)
	Operational risk (Singh, 2010; Fraser, 2008; McShane, 2011; Lewis, 2010; Saunders and Cornett, 2006)
Financial Ratio Financial ratio refers to systematic calculations based on financial statements to evaluate the financial conditions of companies (Ross, et al, 2008)	ROA (Ross, et al, 2008)
	ROE (Ross, et al, 2008)
	CAR (Pradipto, 2011; Ginanjar, 2007)
	NPL (Dendawijaya, 2005; Siamat, 2004)
	NIM (Kunt and Huizinga, 2000; Saragih, 2012)

III.2. QUESTION AND HYPOTHESIS

This study concerns with the relationship between risk and profitability ratio. In particular, the research question on this study is, "how strong does the relationship between profitability ratios and risk in Indonesia's publicly listed banks?" With regard to this research question, the research hypothesis is formulated as;

H_1: Profitability ratios have a weak relationship with risk management of Indonesia's publicly-listed banks.

IV. DATA ANALYSIS

This section outlines the preliminary findings on the sampled banks in this study. Starting with the ratio analysis, it develops into a deeper analysis to draw on conclusion on the proposed hypothesis.

IV.1. FINANCIAL RATIOS

The following table shows the list of each of selected financial ratios in this research. The table shows the results on each of the 19 selected banks, in terms of profitability ratios from 2005 to 2010.

Table 2: Financial Ratios on Selected Banks

Years	ROA	ROE	CAR	NPL	NIM
2005	1.40%	12.23%	16.50%	4.96%	5.74%
2006	1.87%	12.22%	18.14%	4.54%	6.60%
2007	2.01%	14.53%	17.62%	3.72%	6.85%
2008	1.43%	11.93%	16.17%	3.33%	6.18%
2009	0.95%	5.71%	16.10%	4.03%	6.35%
2010	0.97%	10.83%	17.05%	5.08%	6.20%

Source: Banks Financial Statements (2005-2010)

IV.2. RISK MANAGEMENT

IV.2.1. OPERATIONAL RISK

The following table shows the operational risk for the selected banks in this study. As mentioned, the operational risk is proxied by operating expense and operating income on each of the 19 selected banks from 2005 to 2010.

Table 3: Operational Risk

Years	Operating Expense (Rp)	Operating Expense (USD – Rp. 9,900/US$1)	Operating Income (Rp)	Operating Income (USD – Rp. 9,900/US$1)
2005	964,871,452,514	97,461,763	1,063,511,546,149	107,425,408
2006	1,140,723,768,080	115,224,623	1,272,504,822,792	128,535,840
2007	1,395,275,404,513	140,936,910	1,084,163,242,020	109,511,438
2008	1,683,003,801,109	170,000,384	1,316,964,086,828	133,026,675
2009	1,887,592,853,598	190,665,945	1,615,407,024,980	163,172,426
2010	2,122,102,258,444	214,353,763	1,173,673,067,333	118,552,835

Source: Banks Financial Statements (2005-2010)

IV.2.2. CREDIT RISK

The following table shows the credit risk for the selected banks in this study. As mentioned, the credit risk is proxied by total amount of credit granted on each of the 19 selected banks from 2005 to 2010.

Table 4: Credit Risk

Years	Credit Granted (Rp)	Credit Granted (USD)
2005	7,830,623,475,476	790,972,068
2006	8,565,250,617,536	865,176,830
2007	1,013,223,451,552	102,345,803
2008	13,294,919,622,864	1,342,921,174
2009	14,747,519,140,302	1,489,648,398
2010	18,203,013,170,530	1,838,688,199

Source: Banks Financial Statements (2005-2010)

IV.2.3. MARKET RISK

The following table shows the market risk for the selected banks in this study. As mentioned, the market risk is proxied by GDP, inflation rate, and interest rates on each of the 19 selected banks from 2005 to 2010.

Table 5: Market Risk

Years	GDP (Rp)	GDP (USD)	Inflation	Interest Rates
2005	2,530,000,000	255,556	10.45%	10.54%
2006	2,670,000,000	269,697	13.10%	11.83%
2007	2,840,000,000	286,869	5.78%	8.60%
2008	3,010,000,000	304,040	9.51%	8.67%
2009	3,150,000,000	318,182	4.82%	7.15%
2010	3,340,000,000	337,374	5.14%	6.50%

Source: www.bi.go.id and www.bps.go.id (2005-2010)

IV.3. HYPOTHESIS TEST

The following table shows the descriptive statistics on the data set based on the financial statements and annual reports of publicly-listed banks.

Table 6: Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
	Statistic	Statistic	Statistic	Statistic	Statistic
ROA	114	-3.13	8.42	1.1378	1.45046
ROE	114	-1.36	37.70	6.3580	8.19097
CAR	114	.08	29.95	5.1722	8.41512
NPL	114	.01	9.34	.9765	1.78025
NIM	114	.00	16.67	3.6184	4.26477
RM	114	-100.00	33903.02	6.4401E2	4272.22118
Valid N (list wise)	114				

Source: SPSS, modified

The value of standard deviation on risk management indicates a relatively large value in comparison to the other standard deviations. This may portray a signal that the data may not be normally distributed around the means. In order to investigate the value of normality, the following diagram and table are used.

Illustration 1: Normality Test

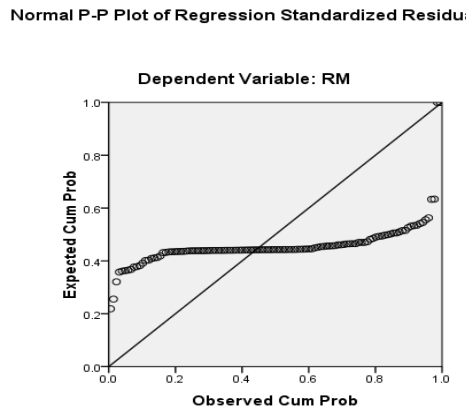


Table 7: Normally Distributed Table (Kolmogorov-Smirnov Test)

		ROA	ROE	CAR	NPL	NIM	RM
N		114	114	114	114	114	114
Normal Parameters[a]	Mean	1.1378	6.3580	5.1722	.9765	3.6184	6.4401E2
	Std. Deviation	1.45046	8.19097	8.41512	1.78025	4.26477	4.27222E3
Most Extreme Differences	Absolute	.186	.283	.425	.359	.276	.476
	Positive	.122	.283	.425	.359	.276	.476
	Negative	-.186	-.189	-.273	-.294	-.198	-.431
Kolmogorov-Smirnov Z		1.986	3.017	4.540	3.832	2.952	5.081
Asymp. Sig. (2-tailed)		.001	.000	.000	.000	.000	.000

[a] Test distribution is Normal

Source: SPSS, modified

From the diagram above, including the normally distributed table, it is clear that the data set is not normally distributed. This signifies the violation of the underlying assumptions on formulating the regression analysis (Field, 2005; Gujarati, 2004).

Table 8: Correlation Table

	RM
ROA	.003
ROE	-.016
CAR	.084
NPL	.103
NIM	-.030

Source: SPSS, modified

As mentioned by Sarwono (2012), a particular issue to note in correlational hypotheses tests is the value of correlations between variables, and the level of significance. Since these data are compiled based on the financial statements and annual reports of the publicly-listed banks, whose statements have gone thorough verifications by independent auditors prior to submissions and publications, statistically, the level of significance may not

be showing the real market conditions. From the table above, it is clear that NPL shows the highest correlation toward risk management. This may be translated as the higher NPL brings about higher risk for banks. In reality, this is truly what is happening. As the NPL increases, banks' cash flows are disturbed. Such disturbances pushes-up overall risk. Though ROE and NIM show negative correlations with relatively minimal values, these indicators provide evidence of some degree of influence toward risk and the general state of risk management in banks. The following table shows the detailed correlations among indicators used in this study.

Table 9: Detailed Correlation Table

	ROA	ROE	CAR	NPL	NIM
Inflation	.105	.072	.283	.248	.064
GDP	-.127	-.088	-.306	-.248	-.096
Interest Rates	.143	.074	.319	.267	.094
Credit Given	-.158	-.203	-.173	-.136	-.199
Operating Expense	.018	.348	-.024	.161	.077
Operating Income	-.123	-.031	-.088	-.055	-.140

Source: SPSS, modified

As previously mentioned, it should be noted, however, that since the level of significance are relatively larger than the tolerable level of potential errors of 5%, or 10%, further statistical analysis on the data set may be misleading. Hence, the regression analysis cannot be developed, as shown in the following ANNOVA table.

Table 10: ANOVA Table calculated by SPSS

Model		Sum of Squares	Df	Mean Square	F	Sig
1	Regression	4.027E7	5	8053084.056	.430	**.827**
	Residual	2.022E9	**108**	1.872E7		
	Total	2.062E9	113			

Source: SPSS

The table above shows that the probability F-test is mere 0.430, with a significant level of 0.827. This confirms the level of insignificance of the profitability ratio toward risk management. Hence, based on these findings, it is safe to conclude that the correlations between profitability ratios and risk management are relatively weak.

V. CONCLUSION AND RECOMMENDATION

V.1. CONCLUSION

The conclusions that can be computed through all the research process are;

1. The statistical findings on each of the selected indicators of profitability ratios are insignificant toward risk management. This may occur due to the limited numbers of proxies used in the study.

2. The correlational study of the selected risk management indicators; market risk (inflation rates, GDP, and interest rates), credit risk (total credit granted), operational risk (operating expense and operating income) with selected profitability ratios; ROA, ROE, CAR, NPL, and NIM indicate both positive and negative correlations, yet insignificant toward each other. The reasons for the insignificant correlational study may be due to the following

reasons;

a. The percentage change of inflation may not provide direct impact toward percentage change in ROA, ROE, and NIM.
b. The percentage change of inflation may only provide direct impact toward percentage change of CAR and NPL. This is particularly true since the level of CAR may be adjusted according to the level of inflation. Also, the level of NPL may fluctuate parallel to the level of inflation. As inflation rises, price level increases. Hence, repayment becomes difficult.

V.2. RECOMMENDATION

Undoubtedly, banks need to constantly conduct and monitor risk management to minimize risks. In particular, it becomes interesting to note the actual drivers of bank risk management, which this study has failed to statistically provide any evidence for. Though it is widely accepted that some macro economic indicators may likely signal the level of risk, it may not be truly the case. Hence, it is important to seek other variables and indicators to work out the influence and significance toward risk factors and general risk management. Such additional variables and/or indicators may include; foreign exchange, types of credit granted (individuals or businesses, operating-type loans or capital expenditure type of loans), or even other behavioral elements to note the bankers' behaviors and/or attitudes toward risks.

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