Off-Balance-Sheet Analysis Toward Risk-Adjusted Performance

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Abstract: *Off-balance sheet is an activity undertaken by a financial institution but not seen or recorded on the balance sheet because such activities do not cause or involve ownership of assets and the issuance of debt instruments (Saunders & Cornett 2003). Off-Balance Sheet activities can be obtained through income derived from non-interest income. The banking industry initiates the off-balance activity to create diversification in obtaining optimal bank returns. This study aims to investigate the effect of revenue diversification from off-balance-sheet activity toward a bank's risk-adjusted performance. This research was conducted in several Commercial Banks in Indonesia. The data collection was based on purposive sampling and statistically analyzed using Eviews version 9.2. This research showed that revenue diversification from off-balance-sheet activity bears positive effects on Commercial Bank's risk-adjusted performance in Indonesia. Off-balance sheet activity was measured by the non-interest income reported in the income statement.*

Keywords: *Off-Balance-Sheet, Diversification, Risk-Adjusted, Non-Interest*

Abstrak: *Off balance sheet adalah aktivitas yang dilakukan oleh institusi keuangan namun tidak nampak pada neraca karena aktivitas ini tidak menyebabkan dan melibatkan kepemilikan asset serta tidak menimbulkan penerbitan hutang (Saunders & Cornett 2003). Pendapatan dari aktivitas Off Balance Sheet dapat diperoleh melalui pendapatan yang berasal dari pendapatan-non bunga. Aktivitas off balance sheet dimulai oleh industri perbankan dengan tujuan menciptakan diversifikasi dalam memperoleh pengembalian bank yang optimal. Penelitian ini bertujuan untuk mengetahui bagaimana pengaruh diversifikasi pendapatan yang timbul dari aktivitas off balance sheet terhadap tingkat pengembalian berbasis risiko pada industri perbankan. Penelitian ini dilakukan di beberapa bank umum di Indonesia. Pengumpulan data berdasarkan purposive sampling dan dianalisis secara statistik menggunakan Eviews versi 9.2. Hasil penelitian menunjukkan bahwa diversifikasi pendapatan dari aktivitas off-balance sheet berpengaruh positif terhadap kinerja yang disesuaikan dengan risiko pada perbankan di Indonesia. Aktivitas off Balance sheet diukur melalui aktivitas yang menimbulkan pendapatan non-bunga yang dilaporkan pada laporan laba rugi.*

Kata Kunci: *Off-Balance-Sheet, Diversifikasi, Risiko, Non-Bunga*

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1. Introduction

This study aims to obtain empirical evidence regarding the relationship of revenue diversification from off-balance-sheet activity toward the bank's risk-adjusted performance on asset and equity, including its effects against risk as measured by the volatility of the rate of return. Since the diversification measurement depends on non-interest income, so this paper also regresses the effects of OBS through non-interest share towards the performance and risk.

Markowitz's theory formulates the elements of return and risk in every investment that the element of risk can be reduced through the benefits of diversification and the incorporation of various investment instruments into a portfolio. Risk-adjusted performance is an investment's profit measurement method by considering the relationship between return and risk itself in a portfolio (Jogiyanto, 2010).

Financial institution recently has made changes from the operational banking activities to Off-Balance Sheet (OBS) activities. It is not merely about the increase in the traditional OBS activities such as guarantees and commitments, but also through the increase of financial derivatives (Gilbert et al.,2013). OBS Activities are not recorded on the balance sheet of the bank as those activities do not involve ownership of assets and the issuance of debt instruments (Gilbert et al.,2013; Saunders and Cornett, 2003). In a commercial bank, the OBS activities consist of guarantees, commitments, market-related activities (financial derivatives), and advisory or management functions (McKee & Albert Kagan, 2018)

Some factors are undermining the operational banking, starting to increase the OBS activities. The factors are deregulation and the advancement of technology (Papanikolaou and Wolff, 2014; Lozano-Vivas & Pasiouras, 2014). Besides, OBS is increased as there is high competition in the banking industry. Therefore, it affects the decline of margin on OBS activities and the demand of capital adequacy requirements from the regulator (Khambata and Hirche, 2002; Lozano-Vivas & Pasiouras, 2014)

Income diversification from non-interest income is a response of the banking industry towards changing economic conditions nowadays. The operational banking practice changes from the net interest income-based activities to the non-interest income

ones or Off-Balance Sheet Activity. This change is related to the structure change of the banking industry in 1997. There was a sharp rise in net operating revenue growth volatility in the non-interest income ratio (Calmes and Theoret 2010).

The net interest income is considered more volatile than the non-interest income. The success of product sales contributing to the interest income depends more on the business condition and the whole market responses. The more volatile the net interest income refers to, the more volatile the net operating revenue. It means that portfolio diversification through the non-interest income can be a beneficial strategy (Altunbas et al., 2011; DeYoung and Torna, 2013; Stiroh, 2004). Banking income from the non-interest income is expected to increase the profitability return rate and decrease the bank risk rate (DeYoung and Torna, 2013; Stiroh, 2004).

The OBS activity is expected to increase the income and return, expand the market and lower the risk derived from the OBS activities (Gilbert et al., 2013). Based on the study done by Khambata and Hirche (2002) on the banking industry in America, on the aggregate level in 1990, the bank volatility revenue decreases as there is a decrease in the net interest income volatility. In 2001, it was seen that the non-interest income donates 43% from the banking net operating revenue. It means that non-interest income is crucial for the banking industry (Gilbert et al., 2013).

The study done in the banks in Canada, US finds that in early 1980, the innovation in finance leads to product innovation, which is more on the market- base. It can be seen as the company's dependency on the financial institution in financing the investment is increasing (Roldos 2006). The crisis of financial deregulation affects the changes in operational banking behavior that tend to decrease the credit fund distribution activities and increase the stocks and bond issuance (DeYoung and Torna, 2013). Progressively, the bank increases the non-traditional activity or called OBS as commission, fee income, and other non-interest income (DeYoung & Torna, 2013; Stiroh & Rumble 2006)

DeYoung et al. (2015) find potential on the advantage gained and a decline of risk rate if the bank expands on the new products. The banking industry in America starts to make a change in its activities to earn income. The income is no longer from loan interest

but through non-interest income such as fee income, service charge, trading revenue, and others (Papanikolaou & Wolff, 2014).

The rise of income through non-interest income can be done through cross-selling and enlarging products by offering products substituting the loan such commitments. This strategy is done to anticipate the economic shocks and financial shocks (Gilbert et al., 2013). In the sampling of the banking industry in the US, it was found that the shift in revenue acquisition through non-interest income will give diversification benefits such as the stability of income flow and the decline of risk rate (Stiroh 2004)

However, Calmes & Theoret (2010) has a different finding that non-interest income growth is considered more volatile than net income growth. Therefore, the banking industry does not only depend on the income earned from non-interest income. The banking management needs to adopt suitable approaches to managing the risk that may arise from the correlation between OBS and balance sheet activities. Demirgüç-Kunt & Huizinga (2010) find the increase of OBS activities may lead to some risks excluding credit risk, such as market risk, interest rate, and liquidity risk (Khambata and Hirche 2002). Despite the fact based on credit risk, it is still considered as the main risk threatening the bankruptcy of a bank (Bank Indonesia, 2014)

This research is an extension of various previous studies related to off-balance sheet activities on performance and risk. This study uses risk-adjusted performance as a measure of return, which links potential returns with adjusted risk. Additionally, this study looks at the direct relationship of the off-balance sheet toward performance and measures the diversification benefits of the off-balance activity through non-interest income.

This study contributes to the development of literature related to off-balance sheet activity and risk-adjusted-performance in the banking industry regarding asset financing schemes. In addition, this study provides empirical evidence regarding the relationship between ROE and ROE to determine risk-adjusted-performance.

2. Theoretical Framework and Hypothesis Development

2.1 Theoretical Framework

The analysis of risk on OBS activities is classified into four different activities, namely (1) guarantees, (2) commitments, (3) market-related activities or derivatives (4) advisory or fee-based services. Fee-based service is considered to have low risk as there is no capital binding or guarantee on this activity (Mckee & Albert Kagan, 2018). Meanwhile, in guarantee, the bank has an obligation to the third party when the second party defaults. Therefore, there is a risk on every guarantee agreement. Bank will get a fee from the deal of guarantee agreement without involving assets and liability that should be reported on the balance sheet. Financial derivatives or market-related activities are the main OBS activities in commercial banks. The examples are foreign exchange contracts, forwards, futures and options, interest swaps, and credit derivatives. Derivatives are considered not too complex and have low risk (DeYoung & Torna, 2013)

Stiroh and Rumble (2006) find that non-interest income especially trading income, is very volatile. It seems that volatility is not related to the rise of Return on Asset and Return on Equity. Besides, the non-interest income and net interest income offered as the banking product increasingly influence each other. As in its activities, the bank offers more fee-based products excluding loan (Stiroh 2004)

Adrian and Shin (2009) find the consistent result of the banking industry changes and activities by degrees leading to shadow banking non-interest income. This case is commonly found in the financial market and institutions, which will adjust to the innovation in finance. (Calmes 2003, Caballero and Engle 2003, Delong and De Young 2007)

Houston and Ryngaert (1994) find that merger done by banking industry offers the possibility of cost-efficiency. The most significant benefit of doing a merger is that the positive focus from location and geography can be achieved. It means that the diversification benefit can be achieved through the income rise from the non-interest income and also from the bank expansion via a merger (DeLong 2001)

2.2 Hypothesis Development

Various studies that have been carried out in the banking industry have found the benefits of diversification of the bank's revenue through OBS activities towards profitability (Gilbert et al., 2013; Lozano & Pasiouras, 2014). As an example, Acharya, Hasan, and Saunders (2002) conducted a study of the banking industry in Italy in the second sub-period 1997 - 2007 and found an increase in OBS activities would increase positive results returns.

Stiroh and Rumble (2006) researched the banking data aggregation on the first quarter in 1998 in the banking industry in Canada. It is found that the rise in the OBS activities increases the banking risk rate. Besides, the rise can reduce the average return rate and increase net operating revenue growth volatility. However, the research done in the banking industry in Europe done in 1997-2007 finds that the OBS activities done through non-interest income can increase the return rate on asset and equity. In the trend of bank operational activities shift, the banking industry in Canada is considered more experienced than in the US. The license to do the OBS activities has been owned by banking in Canada since 1987, although the operation started in 1999 in the US banking industry.

H1: OBS activities have a positive effect on banking performance

Khambata and Hirche (2002) examined the 20 largest commercial banks in the US. They found that the increased concentration of activity in OBS activities was due to banking product innovation, deregulation, advanced technology, and integration of global markets. Saunders and Walter (1994) researched 18 operational bank activities in America and found the benefits of diversifying non-interest products for bank holding companies.

Stiroh and Rumble (2006) researched the banking industry in Europe in 1997 - 2007. They found that diversification of OBS activities carried out through non-interest income could increase the return rate on asset and equity.

H2: Diversification on OBS activities has a positive effect on banking performance.

Khambata and Hirche (2002) studied the OBS activities in the 20 biggest commercial banks in the US. They find no bank reporting the risks caused by OBS

activities, although Basel Committee on Banking Supervision suggests the risk disclosure attached to every banking activity. Their study finds an increase of activity concentration on OBS and expansion on the banking products innovation. The increase of OBS activities happens as there is deregulation on the banking industry, technology advancement, and integration from the global market.

Saunders and Walter (1994) researched 18 operational bank activities in America, of which operational activities have an increase in non-interest activities. This research finds various impacts, and one of them is that an increase in non-interest activities may decline the risk rate on bank holding companies. Following the study done by Templeton and Severiens (1992), it researched the stock market data on 54 bank holding companies.

De Young and Roland (2001) had researched the relationship between profitability, volatility, and the income difference on 472 commercial banks during 1988 – 1995. In conclusion, there is a rise in the fee-based activities that can be called a rise, excluding the loan distribution, investment, deposit, and trading activities that can increase income volatility, profit and positively affect the total leverage. Another research done in the US banking industry finds that the rise of OBS activities impacts net operating revenue growth (Acharya et al. 2002, Stiroh 2004, Stiroh and Rumble 2006, Lepetit et al. 2008).

H3: OBS activities have a negative effect on banking risk

At first, the increase of OBS activities is considered beneficial for the banking return rate (Rose 1989, Saunders and Walter 1994). The diversification benefits can be done by taking more risks through less capital ownership and increasing the distribution of loans (Demsetz and Strahan 1997, and Buiter 2009).

Acharya, Hasan, and Saunders (2002) studied the banking industry in Italy from 1993 to 1999. They conclude that the diversification on banking asset or diversification through loan portfolio does not impact the performance improvement and the decline of the risk. The research done on the banking industry in Canada in 1997 using the ARCH-M procedure finds a premium risk on the bank return rate. In the first sub-period, during 1988- 1996, it is found that the rise of OBS activities has an impact on the risk rate. However, on the next sub-period in 1997-2007, the research shows no negative impact

between those two elements. Templeton and Severiens (1992) examined stock market data on 54 bank holding companies in America. They found that the benefits of income diversification derived from non-interest income may decline the variance shareholder return.

H4: Diversification on OBS activities has a negative effect on banking risk.

Meanwhile, other studies show OBS activities also have the dark side (Kashian & Tao, 2014; Calmes & Theoret, 2010; Demirgüç-Kunt & Huizinga, 2010). OBS activities through non-interest income are considered capable of influencing the volatility of net operating revenue growth and earnings (De Young and Roland 2001; Stiroh 2004; Stiroh and Rumble 2006; Lepetit et al. 2008). The increase of OBS activities may lead to some risks excluding credit risk, such as market risk, interest risk, and liquidity risk (Acharya, Hasan and Saunders 2002, Calmes dan Theoret 2010, Khambata and Hirche 2002). It may happen as the activities on non-interest income are more susceptible to the macroeconomic shocks than the net interest income (Baele et al., 2007; Perera & Wickramanayake, 2014).

Little attention has been given to the alignment between the benefit of OBS activities and the banking risk. Risk-adjusted performance is a combined measurement of return and risk in one evaluation (Jogiyanto, 2010). Therefore, we expand the OBS activity literature by investigating the impact of revenue diversification through OBS activities on risk-adjusted banking performance.

H5: OBS activities have a positive effect on risk-adjusted performance

Another research was done by Calmes and Theoret (2010) in the banking industry in Canada from 1998 to 2007 finds that the banking product diversification through non-interest income cannot get the diversification benefits by itself. However, it impacts the bank exposure, and it is considered risky for the banking system.

H6: Diversification on OBS activities has a positive effect on risk-adjusted performance.

3. Research Method

3.1 Subject of The Research

The sample of this research is the banking industry in Indonesia which is commercial banks, both private and state-owned banks. The data was taken from the financial statement and the income statement quarterly from 2016 to 2018. The criteria in choosing the data are (1) the quarterly financial statement is published completely, (2) there are four quarter financial statements in one year, (3) both the average non-interest income and average net interest income should be positive.

Summary statistics include cross-sectional data from 2016 to 2018. There are 69 samples involving 23 companies in three years of observation quarterly. The summary statistics provide information for the mean, median, standard deviation, minimum and maximum data. The data analysis was based on operational income, net interest income and non-interest income, and risk-adjusted Indonesian banking performance. The data was taken quarterly. The first first-quarter is from 1 January to 31 March, the second quarter is from 1 April to 30 June, the third quarter is from 1 July to 30 September, and the fourth quarter is from 1 October to 31 December.

3.2 Diversification Measures

Diversification is measured using the Herfindahl approach used by Stiroh and Rumble (2006) and Thomas (2002). Measuring revenue diversification (DIV) was done through the variation of two sources of net operating revenue, namely net interest income (NET) and non-interest income (NON). Non-interest income involves calculating the fiduciary income, fees and services charges, trading revenue, and other non-interest income.

DIV shows the degree of diversification on the net operating revenue. The big value indicates that there is a diversified mix. If the value is 0.0, it means that all income comes from one source only or is called full concentration. Meanwhile, value 0.5 means that both net interest income and non-interest income are diversified completely or called complete diversification.

Formula for revenue diversification (DIV) is:

$$DIV = 1 - (SH_{NET}^2 + SH_{NON}^2) \quad (1)$$

in which:

SH_{NET} = part of net operating revenue received from net interest income

SH_{NON} = part of net operating revenue received from non-interest income

The formula for net interest income shares (SH_{NET}) and non-interest income shares (SH_{NON}) is:

$$SH_{NET} = \frac{NET}{NET + NON} \quad (2)$$

$$SH_{NON} = \frac{NON}{NET + NON}$$

The result of the calculation above for the four quarters was averaged to get the average revenue diversification ($\overline{DIV}$), average net interest income shares ($\overline{SH_{net}}$), and the average non-interest income shares ($\overline{SH_{non}}$)

3.3 Performance Measures

The measure of performance on the variable is based on the profitability ratio of Return on Equity (ROE) and Return on Asset (ROA). The value of ROE and ROA results from annualized net income or net income multiplied by four from quarters. If it is divided by equity, it will be the ROE. Meanwhile, if it is divided by asset, it will be the ROA. Afterward, the Average ROE ($\overline{ROE}$) and the average ROA ($\overline{ROA}$) from each quarter are counted for each year researched.

3.3 Level of Risk Measures

The risk level is measured using total profits volatility by Stiroh and Rumble (2006). Profits volatility has resulted from the calculation of standard deviation of ROE (σROE) and standard deviation of ROA (σROA) from the distribution of ROE and ROA on each quarter in the years researched.

3.4 Risk-Adjusted Performance

The dependent variable in this research is risk-adjusted performance will be shown by the size of risk-adjusted return (RAR). RAR can show the amount of return in accounting measure per risk unit. The high RAR indicates the return rate compared to the risk rate that is more optimum. It means that the higher the RAR is, the more optimum the performance of a company is.

Formula risk-adjusted return on Equity (RAR_{ROE}) and risk-adjusted return on Asset (RAR_{ROA}) as:

(3)

$$RAR_{ROE} = \frac{\overline{ROE}}{\sigma ROE}$$

And

$$RAR_{ROA} = \frac{\overline{ROA}}{\sigma ROA}$$

3.5 Control Variable

The control variable used in this research is Ln Asset, Loan to Deposit Ratio (LDR). It is chosen as a total asset can cause a difference in performance affected by the economies of scale, geographic conditions, and different risk management technique. Meanwhile, the Loan to Deposit Ratio (LDR) factor conceivably will affect the performance. An example is some managers who like to have risks. They will have a low tendency in the requirement fulfillment set by the regulator. They will give more loans. Besides, they also like the fast-growing assets. Despite the fact, the amount of the loan given is not necessarily more profitable than the use of other productive assets.

3.6 Analysis Method

This paper does not only research on the effect of revenue diversification (DIV) towards the risk-adjusted performance (RAR) but also regress the effects of non-interest share (SH_{NON}) towards the performance directly. It is done since the average revenue diversification depends on the amount of SH_{NON} . What is seen from the relation from those two variables is linear, in which $SH_{NET} + SH_{NON} = 1$. In other words, the different activities done by the banks will directly affect the outcomes.

The basic formula for cross-sectional regression is:

$$RAR_i = \alpha + \beta_1 \overline{DIV}_i + \beta_2 \overline{SHnon}_{,i} + \overline{\chi}_i + \varepsilon_i$$

in which :

- RAR = performance measures
- $\overline{DIV}$ = average revenue diversification
- $\overline{SHnon}$ = average non-interst share
- $\overline{X}$ = average control variable

3.7 Statistic Description

Regression was done by counting the average of each variable and standard deviations from four quarters each year from period 2016 up to 2018. A data panel from observed years was then made, which combines cross-section – bank data with the time series. The criterion in sampling is the dependent variable in the form of percentage in which the average SH_{NON} should be bigger or as same as zero and should be smaller or as same as one (0<= average SH_{NON}<= 1). The financial report should be presented in four quarters each year.

Table 1 shows the summary of statistics from each dependent Variable, independent, and control Variable. The mean from the risk-adjusted performance measured by return on asset (RAR_{ROA}) during 2016-2018 is 13.042, in which the standard deviation is 18.862. However, the mean measured using return on equity (RAR_{ROE}) is 12.149, in which the standard deviation is 14.870. The maximum of both RAR_{ROA} and RAR_{ROE} was obtained from BBNI bank, yet it happened in the different years. It is seen that the maximum RAR_{ROA} in 2018 reaches the highest score in 112.268. Meanwhile, RAR_{ROE} was 66.520 in 2017. The minimum both RAR_{ROA} and RAR_{ROE} result from the BBNP bank happening in the same year, 2017, in which the RAR_{ROA} is -1.584 and RAR_{ROE} is on -1.569.

Risk-adjusted performance is measured based on the return on asset (ROA) and the return on equity (ROE.). As shown in table 1, the mean of the return rate during the period 2016-2018 is 1.432 for ROA and 5.888 for ROE., in which the standard deviation

of ROA is 1.341 and 6.886 for ROE. The maximum ROA obtained from BBKA bank in 2016 is 3.845. It is seen that ROE. has a maximum value of 19.663 in 2018 obtained from BBRI bank. The minimum value of both ROA and ROE was obtained from BABP bank and happened in the same year, 2017, in which ROA is -2.885, and ROE. is -18.683.

Tabel 1
Summary of statistic

	Mean	Median	Standard deviation	Minimum	Maximum
RAR_{roa}	13.042	6.566	18.862	(1.584)	112.268
RAR_{roe}	12.149	5.716	14.870	(1.569)	66.520
DIV	0.346	0.386	0.113	0.045	0.489
SH_{non}	0.260	0.261	0.130	0.023	0.714
ROA	1.432	1.430	1.341	(2.885)	3.845
ROE	5.888	4.710	6.886	(18.683)	19.663
Assets (Rp m)	207,979,532	87,150,755	297,679,158	7,035,472	1,130,425,353
Loan/ Deposit Ratio	81.538	86.550	13.151	43.720	99.253

The mean from revenue diversification (DIV) during 2016-2018 is 0.346, in which the deviation standard is 0.386. The maximum DIV obtained from BNLI bank in 2017 is 0.489. In the same year, the minimum DIV obtained from MAYA bank is 0.045. One of the variables control related to the interest income (SH_{NET}) is the Loan to Deposit Ratio (LDR). In the period of research, it is seen that the mean of LDR is 81.538 in which the standard deviation is 13.151. The maximum LDR, which is 99.253, happened in 2018 from PNBK bank. Meanwhile, the minimum LDR counted in 43.720 happening in the same year was from AGRO bank.

Variable control in this research involves total assets reported quarterly from 2016 to 2018. The mean total asset is 207,979,532 in rupiah, in which the standard deviation is 297,679,158 in rupiah. The maximum asset counted as 1,130,425,353 in rupiah was the BBRI bank assets in 2018. Meanwhile, BNBA bank in 2016 had the most minimum asset in 7,035,472 in rupiah.

4. Results and Discussion

Table 2 shows the regression from diversification on OBS (DIV), non-interest income (SH_{NON}) as OBS activity toward banking performance (ROA and ROE.) and

regress the impact of those variables towards the banking risk (Std dev). After testing the data panel model, it was decided that regression testing used the fixed-effect model and cross-section weight (PCSE). The symbol (*) shows the significant F-statistics in which the significance level is 5%.

Table 2
Result of Regression Model *Fixed Effect*
Cross-section weights (PCSE) standard errors & covariance (d.f. corrected)

	Return on Asset ROA		Return on Equity (ROE)	
	Mean	Std. dev.	Mean	Std. dev.
DIV	1.537118	-1.040458*	47.3233*	-5.377678*
SHnon	7.070422 *	-1.010177*	49.7905*	-7.439595*
ln (Assets)	0.668122 *	-0.137692*	44.40163*	-1.845159*
Loan/ Deposit ratio	0.014315 *	-0.01241*	0.131569*	-0.045009*
Observations	69	69	69	69
Adjusted R-squared	0.975712	0.846925	0.923869	0.8467

H1 states OBS activities positively affect banking performance; The regression shows that SH_{NON} has a significant effect on ROA and ROE. Furthermore, the SH_{NON} coefficient on ROA is 7.070422 and 49.7905 on ROE. Therefore, it can be stated that OBS activities have a positive effect on banking performance. H1 is thus supported.

Similarly, H2 states that diversification of OBS activities has a positive effect on banking performance. The regression result shows that DIV does not significantly affect ROA. Meanwhile, the banking performance, which is measured by ROE, shows a different result. DIV has a significant effect on ROE. Furthermore, the DIV coefficient on ROE. is 47.3233, which indicates that DIV is positively associated with ROE. Based on the significant F-statistics and DIV coefficient, it can be stated that diversification on OBS activities positively affects banking performance using ROE measurement. Thus, H2 is supported.

H3 states that OBS activities have a negative effect on banking risk. Likewise, H4 states that diversification of OBS activities has a negative effect on banking risk. The test results show that both SH_{NON} and DIV have a significant effect on standard deviation. Hereafter, the SH_{NON} coefficient toward standard deviation of ROA and ROE is -1.010177 and -7.439595, respectively, while the coefficient of DIV against standard deviation is -1.040458 (ROA) and -5.377678 (ROE.). Based on the significant

F-statistics and the coefficient regression, it can be concluded that both OBS activities and diversification on OBS activities have a negative effect on banking risk. Thus, H3 is supported, as well as H4 is supported.

Table 3

Results of Regression Model *Fixed Effect*

Cross-section weights (PCSE) standard errors & covariance (d.f. corrected)

	RAR _{roa}	RAR _{roe}
DIV	28.43628*	20.95587*
SH_{non}	25.01079*	24.67263*
ln (Asset)	16.1543*	16.50205*
Loan/ Deposit Ratio	0.228279*	0.308221*
Observations	69	69
Adjusted R-squared	0,61274	0,653744

Table.3 shows the regression results between DIV and SH_{NON} and also between RAR_{ROA} and RAR_{ROE}. The adjusted r-square of the risk-adjusted performance (RAR.) is 0.61274 for RAR_{ROA} and 0.65374 for RAR_{ROE}. It indicates that 61.27% RAR_{ROA} and 65.37% RAR_{ROE} can be described through the research model. The symbol (*) shows the F-statistics probability is significant in the significance level of 5%.

H5 states that OBS activities have a positive effect on risk-adjusted-performance. Then, it is obtained that the SH_{NON} are significant statistically toward the RAR_{ROA} and ROA_{ROE} with the coefficient regression is 25.01079 and 24.67263, respectively. Based on the significant F-statistics and the coefficient regression, it is clear that OBS activities positively affect risk-adjusted performance, either ROA or ROE. Accordingly, H5 is supported.

Similarly, H6 states that diversification of OBS activities has a positive effect on risk-adjusted performance. The regression result indicates that DIV has a significant effect on the RAR_{ROA} and ROA_{ROE} with the coefficient regression on RAR_{ROA} 28.43628 and 20.95587 on ROA_{ROE}. Thus, the conclusion is evident that diversification of OBS activities has a positive effect on risk-adjusted-performance. Therefore, H6 is supported.

OBS activities have a positive effect on banking performance. Thus, the results of this study support previous research finding that OBS activities will have a positive impact on banks' returns (Acharya, Hasan, and Saunders, 2002). In addition, these results also explain previous research that the OBS activities were carried out in response to banking product innovation, deregulation, technological advances, and global market integration (Khambata and Hirche, 2002).

Diversification on OBS activities has a positive effect significantly on ROE. It indicates that the more diversified the net operating revenue through non-interest income will lead to a higher return. This finding supports various studies that have been conducted in the banking industry regarding the benefits of diversifying toward banking return and risk. OBS activities through bank non-interest income positively impact return rate on asset and equity (Saunders and Walter, 1994; Stiroh and Rumble, 2006).

Moreover, either OBS activities or diversification on OBS activities gives negative effects significantly towards risk that represent through ROA and ROE standard deviation. This finding, along with previous research that the benefits of income diversification derived from non-interest income can decrease the variance shareholder return (Templeton and Severiens, 1992)

The study results show that both OBS activities and diversification on OBS positively affect risk-adjusted-performance. This research finds that the higher the non-interest income will indicate the higher risk-adjusted performance level measured using either rate of return on assets or equity. Besides, diversification of OBS activities has a positive effect on risk-adjusted-performance. In other words, the more diversified the net operating revenue through OBS activities will lead to the higher risk-adjusted performance if it is measured either using the rate of return on assets or equity.

5. Conclusion, Implication, and Limitation

5.1. Conclusion and Implication

This research was conducted at Commercial Banks in Indonesia. This study examines the effect of income diversification through OBS activities on risk-adjusted-performance. This study not only examines the benefits of diversification toward risk-

adjusted performance but also examines the direct effect of OBS activities through non-interest income on risk-adjusted performance.

This research shows that the bank income alternative through non-interest income as OBS activity positively affects the banking performance and risk-adjusted-performance. Conversely, the OBS activity negatively affects banking risk. It means that the higher non-interest income indicates the higher both ROA and ROE. and the better risk-adjusted performance (RAR_{ROA}) and (RAR_{ROE}). The other results found that the dependency of bank strategy on the non-interest income impacts the low level of banking risk measured using either ROA standard deviation or ROE standard deviation.

Secondly, diversification of revenue through non-interest income as an OBS activity has a significant positive effect on banking performance (ROE.) and risk-adjusted-performance (RAR_{ROA}) (RAR_{ROE}). It is explained that the more the operating revenue is being diversified, the higher the return on asset (ROE.) Although it does not have an impact on the return on equity (ROA). The benefit of this diversification is consistent had a positive effect on RAR_{ROA} . It means the more diversified the revenue leads into, the better risk-adjusted performance. In addition, this research found another benefit of a revenue diversification strategy. Diversification through OBS activities has a negative impact on banking risk measured by the standard deviation of ROA and ROE. This implies that the more operating income is diversified, the lower the volatility of ROA and ROE.

This study is aimed at the interests of top management in the organizational structure of the banking system concerning asset financing scheme decisions. The provision of Bank funds to generate income is not limited to providing credit funds. Nevertheless, management able to expand its financing by diversifying income through non-interest income. This study explains that the decision to diversify financing through non-interest products can optimize banking performance.

5.2 Limitations

This study has several limitations. First, off-balance-sheet diversification is limited to the measure of non-interest income, where this income does not appear on the

financial statements. However, there is credit fund financing which also does not appear on the balance sheet. In this case, the gap between the checking account limit and its usage by debtors does not appear on the financial statements but affects the allowance. Therefore, future research could use fluctuations in the use of a checking account as an off-balance-sheet variable. Finally, the performance measure used in this study is risk-adjusted performance, which can be expanded in further research using bank performance measures that are regulated as risk-based bank ratings.

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