Factors that Affect Bank Risk in Commercial Banks that Are Publicly Listed

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Abstract

This study aims to determine the effect of Net Interest Margin (NIM), Non-Performing Loan (NPL), oil price, exchange rate, market power, and female BOD gender on bank risk in go public commercial banks listed on the IDX and KLSE (2009-2019). In this study, the sampling technique used was purposive sampling technique which resulted in 32 banks. The secondary data used is obtained from financial reports published on the official IDX and IDX websites. The data analysis method used in this research is panel data regression analysis. The results showed that the total assets variable affects NIM, NPL, Oil Prices, Exchange Rates, Market Power, and Female BOD Gender on Bank Risk in Go Public Commercial Banks listed on the IDX and KLSE. The regression test results can be concluded that the constant coefficient value of -0.770544 means that if the variable NIM (X1), NPL (X2), Exchange Rate (X3), Oil Price (X4), Market Power (X5), and Female BDO Gender (X6) is zero, then the amount of Bank Risk is -0.1770544.

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1. Introduction

According to Law Number 10 of 1998 concerning Banking, Banks are mentioned as business entities that collect funds from the public in the form of deposits and channel them to the public in the form of credit and or other forms in order to improve people's lives. Commercial banks are banks that carry out business activities conventionally and or based on sharia principles, which in their activities provide services in payment traffic.

The banking industry needs to control the risks of each business unit of the bank. This aims to improve the quality of risk management implementation in the banking industry in Indonesia so as to create a banking industry that can withstand every risk in its business. Every bank business is run in a controlled risk corridor. The orderly implementation of risk management in each bank will ultimately help create a healthy banking industry. The implementation of risk management is an important part of achieving the bank's financial performance. The increase in losses incurred by banks as a result of inadequate risk management practices and the adverse impact on the financial performance of banks is a major concern of bank management and regulators (Fadun & Oye, 2020).

Risk is the opportunity for loss to occur. In Indonesia, the financial industry realizes that risk occurs in every line of business and type of risk. So, it is necessary to have risk management as a structured and systematic process in identifying, measuring, mapping, developing alternative risk handling, monitoring, and controlling risk handling. Good risk management and governance are expected to detect losses that may arise in the future and the need for additional capital if the impact of projected losses can result in the amount of capital below the minimum required by the Bank Indonesia supervisory authority. Risk profile factor assessment is an assessment of inherent risk and the quality of risk management implementation in the bank's operational activities. Risks that must be assessed consist of 8 (eight) types of risks, which is credit risk, market risk, operational risk, liquidity risk, legal risk, strategic risk, compliance risk, and reputation risk (Bank Indonesia: SEBI No. 13/24/DPNP: 2011).

Banking risk management will affect the soundness of the bank as Bank Indonesia assesses banking performance based on the bank's risk management (Bank Indonesia Regulation No: 13/1/PBI/2011). Banks in Indonesia must assess the risks they face and these banks are required to publish their risk profile in their financial statements. The presentation of the risk profile provides transparency of banking performance that is useful for stakeholders such as debtors, investors, and others.

Banking companies in Indonesia include state-owned banks, foreign exchange national private commercial banks, non-foreign exchange national private commercial banks, regional development banks, mixed banks, and foreign banks. Commercial banks can be divided into two categories, which is, go-public commercial banks and non-go-public commercial banks. Banks that have status as public companies are required to be more transparent in carrying out their activities because every event or incident that occurs will be in the spotlight of the public,

investors, and the mass media.

Banks that have gone public status must be able to manage as well as possible the funds obtained from the public, especially the management of their capital because it will be the concern of customers and investors. Therefore, banks must be able to provide information about their operational activities and financial condition.

Risk profile is one of the indicators used by investors as one of the stakeholder indicators to assess the condition of the company (Khairani & Dillak, 2018). Many internal factors can affect bank risk, including the cost of financial intermediation, which is measured by the difference between the interest income earned by the bank and the interest expense that must be borne by the bank (Net Interest Margin). NIM is used to measure the ability of bank management to earn income by using its productive assets, considering that the bank's operating income is highly dependent on the difference in interest from loans disbursed.

One of the factors that determine profitability is the fluctuating lending rates that have a direct impact on customers and the bank itself. The increasing credit interest rates will also result in bad debts, caused by debtors who borrow money from the bank may not be able to pay their debts. High credit interest rates will cause people to be unable to pay interest and principal debts, resulting in bad credit, this increases the NPL (Non-Performing Loan) ratio of a bank and reduces the level of bank health in terms of profitability.

Macroeconomic factors such as inflation rates, world oil, and gold prices, bank interest rates, the value of the dollar against the rupiah, and various other factors. A macroeconomic variable that often changes is the world oil price. This can be seen throughout 2019, the average Brent crude oil futures price was at US$ 64.5 per barrel. The US benchmark crude oil futures price, WTI, stood at US$ 57 per barrel. When compared to the position at the beginning of last year (year on year/yoy), Brent oil prices rose 23.2% and WTI oil rose higher by 35.3%.

The exchange rate as one of the macroeconomic variables also continued to change. The rupiah exchange rate against the US dollar was recorded at Rp14,250 per US dollar or strengthened by 0.91 percent compared to the year-end 2018 level of Rp14,380 per US dollar. Meanwhile, on average in 2019 the rupiah exchange rate reached Rp14,180 per US dollar or strengthened 0.41 percent compared to the average in 2018 of Rp14,246 per US dollar. The trend of Indonesia's currency exchange rate continues to experience an increase in depreciation. This makes the value of the rupiah currency fall against foreign currencies. This condition will cause problems for economic activity actors who use imported raw materials.

The depreciation of the rupiah will increase the price of raw materials and burden production costs it will reduce the income of these producers. This will ultimately result in a default on loan payments to banks so it will increase the NPF ratio of banks. Research conducted by Shingjergji (2013) found that the exchange rate has a positive relationship with the banking NPL ratio. In contrast to these results, research by Linda, Wati, & Wati (2015) research by Febrianti & Ashar (2016) found that the exchange rate has no significant effect on banking NPF.

Female board diversity can improve the company's ability to achieve financial

performance. The reason is that it can represent the interests of different stakeholders (Harjoto et al., 2015). On the other hand, the positive impact on firm performance caused by high gender diversity on the board is still not widely accepted by specialized literature (Joecks et al., 2013). Previous research related to gender diversity and firm performance obtained negative results (de Andres et al., 2005), while other researchers showed a positive effect (Campbell and Mínguez-Vera, 2008). In fact, some researchers found a relationship between the two variables (Rose, 2007). Research in Indonesia itself, obtained mixed results. Wijaya and Suprasto (2015) prove a positive effect, other studies show no effect (Mardiyati, 2012; Astuti, 2017).

2. Banking Theory

Bank is an institution that receives or collects funds from the public and then distributes them to other parties in need either by credit or by other instruments approved by government regulations. Based on this concept, in short, the bank has a function as a transformation institution. The transformation carried out by the bank is the transformation of time, size, risk and liquidity. Funds are collected from the community in small to large amounts and channeled with a larger value (size) to the community, although generally to companies and to individuals in the form of individual loans, which are better known as consumer loans (Manurung, 2017).

Banks in their activities carry out transformations for value, risk time and liquidity. This means that the bank receives or collects funds from parties with a surplus and distributes them to those with a deficit. Households save in the form of securities or time deposits. If the securities held, the household carries out its activities in the financial market. If savings are made in deposits, the funds are placed in a bank. If the company needs funds, the company can obtain funds from the financial market sector at the bank. In the financial market sector, banks can sell debentures or shares. If a company obtains funding from a bank, it is known as credit, so that the bank's financial statements appear credit. (Manurung, 2017, p.5).
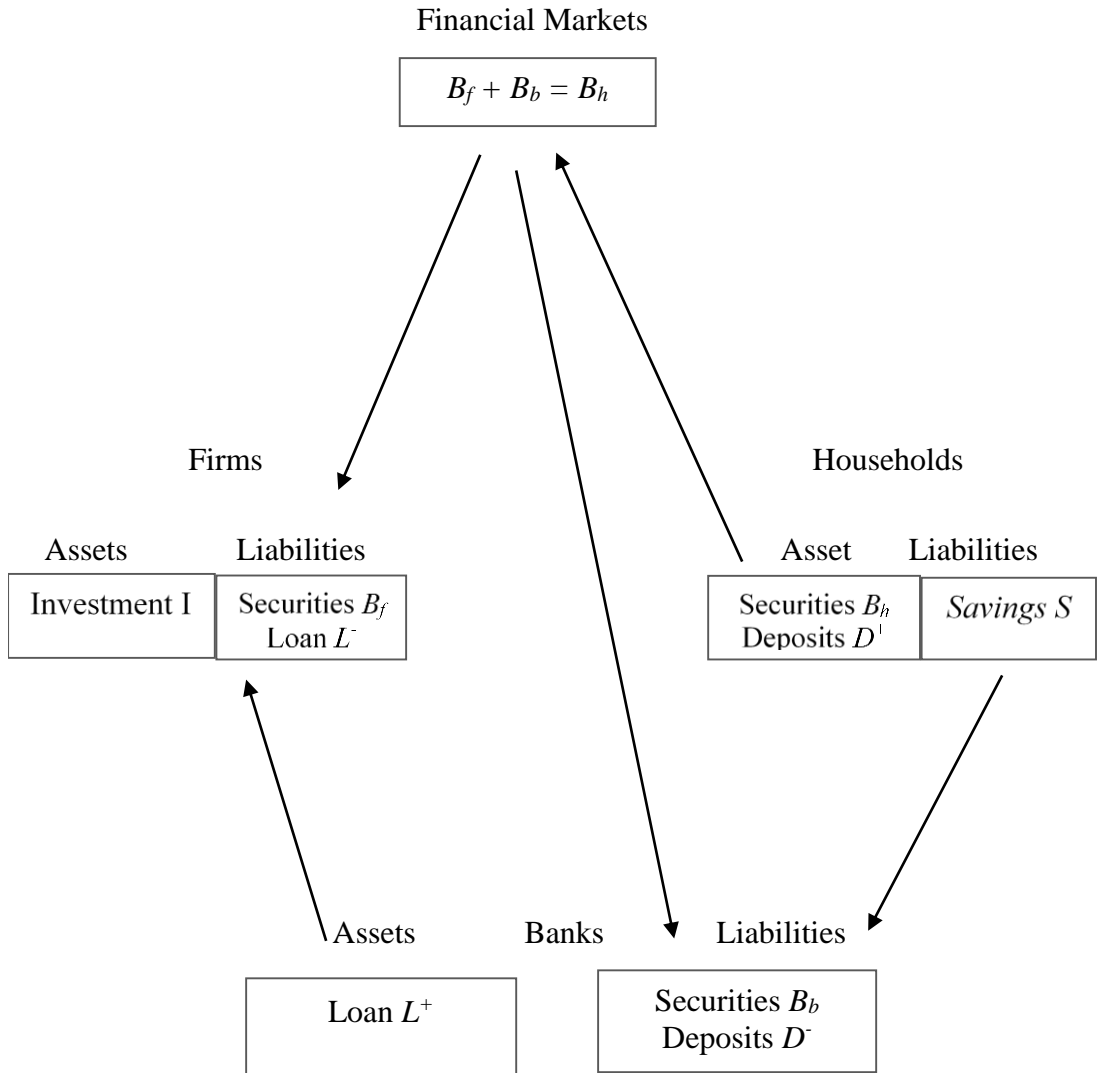
Financial Markets

$$B_f + B_b = B_h$$

Firms

Assets	Liabilities
Investment I	Securities B_f
	Loan L^-

Households

Asset	Liabilities
Securities B_h	*Savings S*
Deposits $D^|$	

Banks

Assets	Liabilities
Loan L^+	Securities B_b
	Deposits D^-

Figure 1: Economic Agency Financial Decisions

Financial decisions of economic agents in the simple model in the picture above. each type of agent is denoted by a specific subscript: f for company, h for household and b for bank. For simplicity, the public sector (government and central bank) is omitted (Freixas and Rochet, 2008).

2.1 Consumer

The consumer chooses his consumption profile (C1, C2) and the allocation of his savings between D_h bank deposits and B_h securities (bonds), in a way that maximizes his utility function under his budget constraint:

$$\left[\begin{array}{l} \text{Max u(C1, C2)} \\[6pt] \text{Ph} \quad \text{C1 + Bh + Dh} = \omega\text{I,} \\ \text{P c2} = \Pi\text{f+ }\Pi\text{b+(1+r)Bh+(1+rd)Dh} \end{array}\right.$$

ωI denotes the initial funding of consumer goods, P denotes the price of C2, Π_f and Π_b which respectively represent the profits of companies and banks (distributed to consumer shareholders at t = 2) and r and rd are the interest rates paid by bonds and deposits. Since, securities and bank deposits are perfect substitutes, it is clear that consumer (Ph) programs have an interior solution only when these interest rates are the same: r = r_d (Freixas and Rochet, 2008).

2.2   Company
The company chooses investment grade I and finances it through bank loans Lf and issuing Bf securities in a profit-maximizing manner:

$$\left[\begin{array}{l} \text{Max } \Pi_f \\[6pt] \text{Ph} \quad \Pi_f = \text{Pf (I)} - (1 + r)\text{ Bf} - (1 + \text{rL})\text{ Lf,} \\ \text{I} = \text{B}_f + \text{L}_f \end{array}\right.$$

Where f denotes the production function of the representative company and rL is the bank loan interest rate. Because bank loans and bonds here are perfect substitutes, Pf has an interior solution only when: r = rL (Freixas and Rochet, 2008).

2.3   Bank
The bank chooses the supply of Lb loans, the demand for deposits of Db and the issuance of Bb bonds in a way that maximizes its profits (Freixas and Rochet, 2008).

$$\left[\begin{array}{l} \text{Max } \Pi\text{b} \\[6pt] \text{Pb} \quad \Pi\text{b} = \text{rLLb} - \text{rBb} - \text{rDDb,} \\ \text{Lb} = \text{Bb} + \text{Db} \end{array}\right.$$

2.4　General Equilibrium

The general equilibrium is characterized by an interest rate vector (r, r L,r D) and three demand and supply level vectors (C1, C2, Bh, Dh) for consumers, (I, Bf, Lf) for firms and (Lb,Bb, Db) for the bank, so that each agent behaves optimally (its decision respectively solves P h, P f, or P b); any free market (Freixas and Rochet, 2008).

I = S (good market)
Db = Dh (Deposit Market)
Lf = Lb (Credit Market)
Bh = Bf + Bb (Bond Market)

In banks it is clear that banks are intermediary institutions where there are liabilities in the form of securities and assets in the form of investments. Assets in the form of investment can be stated in the form of credit, securities such as bonds and cash while banks abroad can invest in stocks and commodities. While in the company there are also securities and loans for sources of funding and investment as opposed to the balance sheet (Freixas and Rochet, 2008).

3. Operational Variable and Methods

3.1　Bank Risks

Every activity carried out by humans, even technology, has risks that will be faced. Manurung (2017) defines risk as "the loss experienced by an institution due to unclear events that will occur in the future where risk can be measured and minimized". Manurung (2018) defines risk as "The volatility of unexpected outcomes, which can represent the value of assets, equity or earnings". Based on some of the definitions above, the onset of a risk cannot be predicted with certainty when it will come.

3.2　Net Interest Margin

To measure the interest profit received by banks from their business activities, ratio analysis is used. One of the ratios used is Net Interest Margin (NIM). NIM is the ratio between Interest Income minus Interest Expenses divided by Average Interest Earning Assets. Dendawijaya (2005: 122) in Dewi (2017), Net Interest Margin (NIM) is:"The ratio used to measure the ability of bank management in managing its productive assets to generate net interest income. The greater this ratio, the increase in interest income on productive assets managed by the bank, so that the possibility of a bank in problematic conditions getting smaller ".
NIM is also measured by the ratio of net interest income to earning assets. Net interest income is obtained from interest income minus interest expense. Productive assets that are taken into account are interest-earning productive assets such as placements with other banks, securities, investments, and loans.

3.3   Non-Performing Loan (NPL)

One way to measure non-performing loans or bad debts is by using ratio analysis, especially the Non-Performing Loan (NPL) ratio. According to Taswan (2008: 61) in Dewi (2017) the definition of NPL is: "the ratio used to measure the ability of bank management to manage non-performing loans granted by the bank. The credit risk accepted by the bank is one of the bank's business risks, resulting from uncertainty in its return or resulting from the non-payment of credit provided by the bank to the debtor ".

3.4   World Oil Price

In this study, the unit of measure for crude oil used is the barrel. The currency used as a medium of exchange is the United States dollar. One of the choices of the US dollar as a medium of exchange for oil is because the US dollar is known almost all over the world. Along with the emergence of newly industrialized countries, the demand for crude oil will be higher. The increase in demand for crude oil will directly affect the world price of crude oil. If this is related to economic activity, the price of oil will affect the economy of a country.

3.5   Exchange Rate

The exchange rate in a country can be influenced by government policies set in the country. Government policy in strengthening a country's exchange rate significantly against other countries' exchange rates is called revaluation. While the government policy of significantly weakening a country's exchange rate against other countries' exchange rates is called devaluation (Syarifuddin, 2016).

3.6   Market Power

Market power is one of the external factors that influence bank risk-taking in Indonesia. Berger et al. (2009) argue that concentration competition can influence each other and can significantly affect bank risk-taking. According to Guerrero-Mora and Sepulveda-Villareal, companies that have great market power are able to maintain the elasticity of consumer demand for their products to be more rigid. If the elasticity of consumer demand for the company's products is relatively rigid, the company will be able to make consumers more dependent on the company's products (Manurung and Hutahayan, 2020).

3.7   Women's BOD Gender

Gender is the difference and function of social roles constructed by society. Based on the current investment trend towards socially responsible investment, when investment decision-making by investors and analysts (market opinion makers) considers the presence of equal numbers of women and men (gender diversity) on the board as a positive investment variable, it can encourage the company's stock preference and thus can drive the demand for the company's shares (Michellianouva et, 2020). As a result, economic results, media visibility, and demonstration of

commitment to social and ethical issues can lead to increased demand for shares and an increase in the company's share price.

Whether or not the number of women has an effect on firm performance may be due to the overall low or high representation of women (Joecks et al., 2013). Differences in innate characteristics between women and men such as women being more risk averse than men (Croson and Gneezy, 2009) and women often proposing less aggressive strategies and sustainable investment criteria (Apesteguia et al., 2012), as well as gender diversity on boards, can add value to male-dominated boards through the submission of different perspectives (Farrell and Hersch, 2005).

3.8   Total Company Assets

According to Dang et al (2017), one of the company sizes is from total assets, which is by means of the natural logarithm of the company's total assets. Measurement of total assets using the logarithm of total assets, the use of the natural logarithm (Ln) in this study is intended to reduce data fluctuations and excessive numbers. If the total asset value is used directly, the variable value will be very large, which is billions and even trillions. By using the natural logarithm of total assets, the value of billions and even trillions can be simplified, without changing the proportion of the actual original value.

3.9   Estimation Methods

The data in this study were collected through secondary data collection, in the form of time series and cross-sections. The data used in this study are commercial banks going public that report their finances to Bank Indonesia and commercial banks going public in Malaysia during the study period, which is from 2009 to 2019. Data sources were obtained through the Indonesia Stock Exchange website, which is http://www.idx.co.id, http://www.bursamalaysia.com, and www.bloomberg.com and economic journal articles.

4. Analysis

Data analysis is an important thing to do in conducting a study. With the right analysis, it becomes useful for solving the problem at hand. The analysis is carried out in the following way:

1. Collecting banking financial report data during the 2009-2019 period accessed through the websites www.idx.co.id, www.bursamalaysia.com, and www.finance.yahoo.com
2. The panel data model is used in this study to predict how far the influence of the independent variables on the dependent variable is, panel data is a combination of time series and cross-section data, able to provide more data so as to produce a greater degree of freedom.

Table 1: Statistics Descriptive variable in study

	Bank Risk	Total Asset	NIM	NPL	EXCHANGE RATE	OIL PRICE	Market Power	Gender BDO
Mean	0.004298	0.469107	0.739744	0.269940	13.572442	56.132664	1.785436	0.173526
Median	0.005850	0.342763	0.725275	0.399975	0.2156432	29.793145	2.850000	0.758929
Maximum	0.113000	0.327653	0.835165	0.464430	15.354446	73.221316	18.543227	0.427843
Minimum	-0.201300	-0.134254	0.670330	0.129421	9.796261	27.874484	0.231554	0.000000
Std. Dev.	0.048177	0.125561	0.045354	0.149762	0.585217	8.319775	1.341870	0.194421
Skewness	-1.198343	-1.425132	0.672097	-1.537715	3.153667	0.298945	0.026963	0.307215
Kurtosis	8.267382	5.327765	2.149337	4.146588	11.22430	2.267010	2.965338	1.385402
Jarque-Bera	83.72356	47.309041	6.326212	26.93232	268.5539	2.236865	0.010274	7.461130
Probability	0.000000	0.000000	0.042294	0.000001	0.000000	0.326792	0.994876	0.023979
Sum	0.257900	0.271640	44.38462	58.19641	0.073400	1806.039	162.1300	48.32143
Sum Sq.Dev.	0.136938	0.212647	0.121360	0.146100	0.001015	102.7665	106.2362	1.019579
Observations	320	320	320	320	320	320	320	320

Source: Output Eviews, 2021

From Table 1, the results of descriptive statistical testing show the minimum, maximum, average (mean), and standard deviation values for each variable. It is known that the smallest value (minimum) of bank risk is -0.201300, meaning that the lowest return vulnerability is -0.201% of the bank's total investment. The largest value (maximum) of 0.113 means that the bank's largest return vulnerability amounts to 1.13% of the bank's total assets. The average value (mean) for the bank risk variable obtained a mean value of 0.0042 with positive results indicates that banks have good portfolio risk. This shows the level of bank risk to generate profits in managing funds invested in overall assets, so the higher the bank's risk level is usually also followed by large profits. The magnitude of the standard deviation of 0.0481 which is greater than the average value, explains the magnitude of the deviation of the bank's ability to generate profits from the average bank risk generated.

4.1   Data Model Selection Results
4.1.1   Chow Test

If in panel data analysis there are three models offered, which are Ordinary Least Square (Common Effect), fixed effect model, and random effect model. From the test results with the Chow Test in Table 2, it can be seen that the Cross-Section F probability value is 0.0000 (<0.05), meaning that H0 is rejected. Thus, Ha is accepted, Ha in the Chow Test is the Fixed Effect Model, so according to the Chow Test, the right model for this panel data test is the Fixed Effect Model.

Table 2: Chow Test Variabel Bank Risk

Redundant Fixed Effects Tests			
Effects Test	**Statistic**	**d.f.**	**Prob.**
Cross-section F	5.677533	(11.42)	0.0000
Cross-section Chi-square	54.663975	11	0.0000
Equation: Untitled Test cross-section fixed effects			

Source: Output Eviews, 2021

From the test results with the chow test above, it can be seen that the Cross-Section F probability value is 0.8028 (> 0.05), meaning that Ha is rejected. Thus H0 is accepted, H0 in the Chow Test is the Random Effect Model, so according to the Chow Test the right model for this panel data test is the Common Effect Model.

4.2   Hausman Test

Table 3: Hausman Test

Correlated Random Effects - Hausman Test			
Test Summary	**Chi-Sq. Statistic**	**Chi-Sq. d.f.**	**Prob.**
Cross-section random	10.294540	6	0.0555
Equation: Untitled Test cross-section random effects			

Source: Output Eviews, 2021

From the test results with the Hausman Test above, it can be seen that the Chi-Square probability value is 0.0555 (> 0.05), meaning that H0 is accepted. Thus Ha is rejected, so according to the Hausman Test, the right model for this panel data test is the Fixed Effect Model.

4.3   Lagrance Multiplier (LM) Test

Lagrange Multiplier test to choose whether the Commont Effect or Random Effect model is more appropriate to use in the panel data regression equation model. After obtaining the calculated LM value, the calculated LM value is compared with the

chi-squared table value with a degree of freedom as many as the number of independent variables (free) and alpha or a significant level of 5%.

Table 4: Lagrange Multiplier (LM) Test

Test Hypothesis			
	Cross-section	**Time**	**Both**
Breusch-Pagan	6.196239	0.801271	6.997510
	(0.0128)	(0.3707)	(0.0082)
Honda	2.489225	-0.895137	1.127190
	(0.0064)	--	(0.1298)
King-Wu	2.489225	-0.895137	0.518880
	(0.0064)	--	(0.3019)
Standardized Honda	4.470405	-0.701671	-1.251242
	(0.0000)	--	--
Standardized King-Wu	4.470405	-0.701671	-1.766755
	(0.0000)	--	--
Gourierioux, et al.*	--	--	6.196239
			(< 0.05)
*Mixed chi-square asymptotic critical values:			
1%	7.289		
5%	4.321		
10%	2.952		
Lagrange Multiplier Tests for Random Effects Null hypotheses: No effects Alternative hypotheses: Two-sided (Breusch-Pagan) and one sided (all others) alternatives			

Source: Output Eviews, 2021

From the test results with the Lagrange Multiplier (LM) Test above, it can be seen that the calculated LM value is 0.0128 (<0.05), meaning that the calculated LM value> Chi-Square table, the model chosen is the Random Effect Model. Based on previous tests for the Bank Risk Variable, the Random Effect Model has been selected 2 (two) times, which is in the Hausman Test and the Lagrange Multiplier (LM) Test, while the Fixed Effect Model is only selected in the Chow test. Meanwhile, the Common Effect Model in the test was not selected at all. Then it can be concluded that of the three models (Common Effect Model, Fix Effect Model and Random Effect Model), the Fixed Effect Model is better at interpreting panel data regression to answer this research.

4.4   Panel Data Regression Analysis Results
Regression analysis with panel data models is used to estimate the effect of NIM, NPL, Exchange Rate, Oil Price, Market Power, and Female BDO Gender on Bank Risk. The use of panel data will produce different intercept and slope coefficients

for each company and each time period.

Table 5: Regression Test Variable Bank Risk

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.770544	0.588864	-1.308525	0.1978
NIM	0.466476	0.247379	1.885676	0.0663
NPL	0.344266	0.353213	0.974670	0.3353
EXCHANGE RATE	4.074416	6.037602	0.674840	0.5035
OIL PRICE	-0.007992	0.017040	-0.469036	0.6415
MARKET POWER	-0.014358	0.004926	-2.914363	0.0057
GENDER BDO	0.459725	0.143248	3.209287	0.0026
Effects Specification				
Cross-section fixed (dummy variables)				
R-squared	0.708810	Mean dependent var		0.004298
Adjusted R-squared	0.590947	S.D. dependent var		0.048177
S.E. of regression	0.030812	Akaike info criterion		-3.878471
Sum squared resid	0.039875	Schwarz criterion		-3.250168
Log likelihood	134.3541	Hannan-Quinn critter		-3.632707
F-statistic	6.013859	Durbin-Watson stat		1.549690
Prob(F-statistic)	0.000001			

Source: Output Eviews, 2021

From the regression test equation, it can be concluded that the constant coefficient value of -0.770544 means that if the variable NIM (X1), NPL (X2), Exchange Rate (X3), Oil Price (X4), Market Power (X5), and Gender BDO Women (X6) is zero, then the amount of Bank Risk is -0.1770544.

1. The regression coefficient value of variable X1 (Net Interest Margin) is positive, which is 0.466476, meaning that every 1% increase (Net Interest Margin) is predicted to increase Bank Risk by 0.466476, assuming other variables remain constant.
2. The regression coefficient value of the X2 variable (Non-Performing Loan) is negative, which is -0.1344266, meaning that every 1% increase in Non-Performing Loan is predicted to reduce Bank Risk by -0. 344266 assuming other variables remain.
3. The regression coefficient of variable X3 (Rupiah Exchange Rate) is negative, which is 4.074416, meaning that every 1% increase in the Rupiah Exchange Rate is predicted to increase Bank Risk by 4.074416, assuming other variables remain constant.
4. The regression coefficient value of variable X4 (Oil Price) is negative, which is -0.007992, meaning that every 1% increase in Oil Price is predicted to reduce Bank Risk by -0.007992, assuming other variables remain constant.
5. The regression coefficient value of variable X5 (Market Power) is negative, amounting to -0.014358, meaning that every 1% increase in Market Power

is predicted to reduce Bank Risk by -0.014358, assuming other variables remain constant.

6. The regression coefficient value of variable X6 (Female BDO Gender) is negative, which is 0.459725, meaning that every 1% increase in Female BDO Gender is predicted to increase Bank Risk by 0.459725, assuming other variables remain constant.

5. Classical Assumption Test Results

5.1 Data Normality Test

The normality test is used to determine whether the data presented for further analysis is normally distributed or not. A good regression model should be normally distributed or close to normal. The following is a normality test through regression calculations using Eviews.
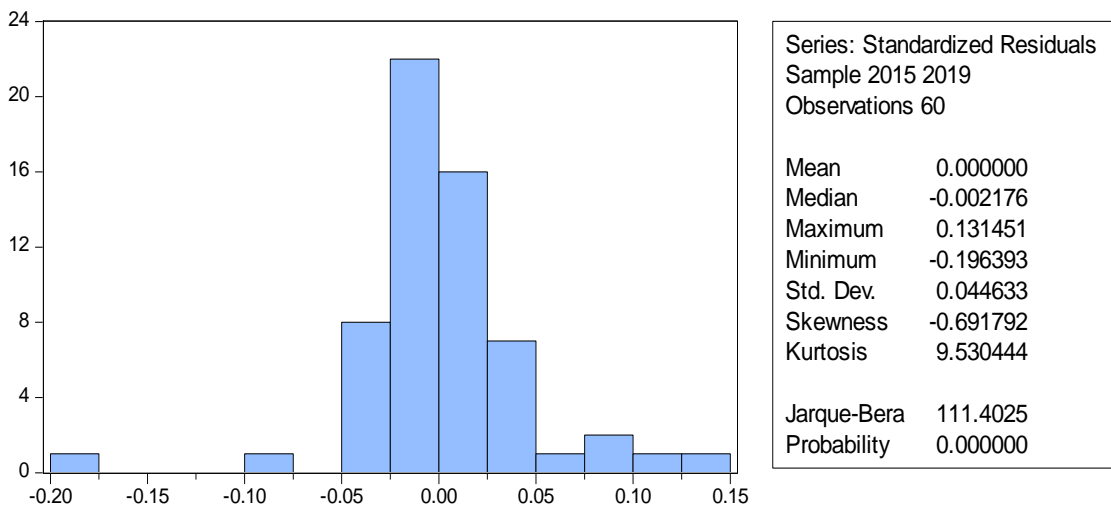

Figure 2: Normality Test

Source: Output Eviews, 2021

The decision on whether the residuals are normally distributed is simply by comparing the calculated JB (Jarque-Bera) Probability value with an alpha level of 0.05 (5%). If Prob. JB count is greater than 0.05, it can be concluded that the residuals are normally distributed and vice versa, if the value is smaller, there is not enough evidence to state that the residuals are normally distributed. Prob value. JB calculated at $0.00000 < 0.05$ so it can be concluded that the residuals are not normally distributed.

5.2   Multicollinearity Test

The multicollinearity test is used to determine whether there is a correlation or intercorrelation between the independent variables in the regression. Multicollinearity test results using Eviews.

Table 6: Multicollinearity Test

Variable	Coefficient Variance	Uncentered VIF	Centered VIF
C	0.043917	1408.267	NA
NIM	0.056090	987.8774	3.638004
NPL	0.024059	727.6848	1.878578
EXCHANGE RATE	4.681353	2.765029	2.540375
OIL PRICE	6.48E-05	1887.408	3.561184
MARKET POWER	2.32E-05	6.749036	1.317181
GENDER BDO	0.002709	57.82419	1.476286

Source: Output Eviews, 2021

The results of the multicollinearity test can be seen in the Centered VIF column table. The VIF value for the independent variables is no greater than 10 or 5 (many books require no more than 10, but some require no more than 5), so it can be said that there is no multicollinearity in the two independent variables.

Autocorrelation Test

The autocorrelation test aims to test whether, in the regression model, there is a correlation between confounding errors in period t and confounding errors in period t -1 (previous). Autocorrelation is often found in time-series data because disturbances in one entity tend to affect the disturbance of the same entity in the next period.

Table 7: Autocorrelation Test

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.036495	0.196421	0.185802	0.8533
NIM	0.084447	0.221841	0.380666	0.7050
NPL	-0.013973	0.143606	-0.097299	0.9229
EXCHANGE RATE	0.262192	2.004279	0.130816	0.8964
OIL PRICE	-0.003279	0.007704	-0.425601	0.6722
MARKET POWER	0.001245	0.004477	0.278025	0.7821
GENDER BDO	0.012355	0.048891	0.252704	0.8015
RESID(-1)	0.454990	0.141921	3.205930	0.0023
RESID(-2)	-0.054487	0.148652	-0.366539	0.7155
R-squared	0.176038	Mean dependent var		-4.12E-17
Adjusted R-squared	0.046789	S.D. dependent var		0.040998
S.E. of regression	0.040027	Akaike info criterion		-3.461035
Sum squared resid	0.081711	Schwarz criterion		-3.146884
Log-likelihood	112.8311	Hannan-Quinn critter.		-3.338153
F-statistic	1.362005	Durbin-Watson stat		1.913274
Prob(F-statistic)	0.235638			

Source: Output Eviews, 2021

Based on the test results, it is known that if the DW value = 1.913274, the dL and dU values derived from the Durbin Watson Table for a significance level of 5%, t = 320 and k = 6, namely dU = 1.6815, the 4-dU value = 4-du = 4-1.6815 = 2.3185. Because the DW value is between dU and 4-dU 1.6815 < 1.939 < 2.3185, it can be concluded that the correlation coefficient is equal to zero. This means that there is no autocorrelation in this study.

Heteroscedasticity Test

This test is to determine whether in this regression model, there are differences in variance from the residuals of the known independent variables. A good regression model is if there is no heteroscedasticity. The following are the results of the heteroscedasticity test using Eviews.

Table 8: Heteroscedasticity Test

Heteroskedasticity Test: White			
F-statistic	0.814696	Prob. F(25,34)	0.6995
Obs*R-squared	22.47752	Prob. Chi-Square(25)	0.6080
Scaled explained SS	82.78868	Prob. Chi-Square(25)	0.0000

Source: Output Eiews, 2021

From the results of the heteroscedasticity test using the white method, the probability value is 0.608> 0.05 so it can be concluded that there are no symptoms of heteroscedasticity.

5.3   Hypothesis Testing
5.3.1   Statistical Test t

A partial test of the t-test is used to determine the effect of each independent variable in explaining the variation in the dependent variable. This test is carried out by looking at the p-value probability, if the p-value probability $< \alpha$ 0.05 then H0 is rejected, which means that the variable has a significant effect. Conversely, if the probability p-value$> \alpha$ 0.05 then H0 is accepted, meaning that the variable does not have a significant effect.

Table 9: Heteroscedasticity

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.146713	0.291526	0.503261	0.6169
NIM	0.493219	0.209391	2.355492	0.0222
NPL	0.149752	0.201508	0.743157	0.0460
EXCHANGE RATE	2.357259	3.003970	0.784715	0.0361
OIL PRICE	-0.010961	0.009492	-1.154705	0.2534
MARKET POWER	-0.015677	0.004296	-3.648997	0.8665
GENDER BDO	0.012794	0.075746	-0.168900	0.2563

Source: Output Eviews, 2021

Based on the results in Table 9, the NIM variable has a significant effect on bank risk because the variable probability level is smaller than 0.05 ($0.022 < \alpha$ 0.05). NPL variable has a significant effect on bank risk because the probability level of the variable is smaller than 0.05 ($0.046 < \alpha$ 0.05). The Exchange Rate variable has a significant effect on bank risk because the variable probability level is smaller than 0.05 ($0.0361 < \alpha$ 0.05). The Oil Price variable has no significant effect on bank risk because the variable probability level is greater than 0.05 ($0.2534 > \alpha$ 0.05). Market Power variable has no significant effect on bank risk because the probability level of the variable is greater than 0.05 ($0.8665 < \alpha$ 0.05). The female BDO Gender variable has no significant effect on bank risk because the variable probability level is greater than 0.05 ($0.2563 < \alpha$ 0.05).

5.4   F test

The Goodness of Fit test or F test is a test conducted to determine whether a model has met the fit criteria or not. To test whether the independent variables jointly affect the dependent variable, the F test is carried out. The F test is carried out by comparing the p-value of the independent variable with a significant level ($\alpha = 5\%$). If F-count$>$ F-table or Prob.sig $< \alpha = 5\%$ means that each independent variable has a significant effect on the dependent variable.

Table 10: F test

R-squared	0.266414	Mean dependent var	0.001767
Adjusted R-squared	0.183367	S.D. dependent var	0.037845
S.E. of regression	0.034200	Sum squared resid	0.061991
F-statistic	3.207973	Durbin-Watson stat	1.045402
Prob(F-statistic)	0.009224		

Source: Output Eviews, 2021

Simultaneous Effect of NIM, NPL, Exchange Rate, Oil Price, Market Power, and Female BDO Gender on Bank Risk. From the results of the analysis conducted, it is known that the F-statistic value is 3.207973 with a statistical probability value of 0.004. With a p-value significance probability of 0.004 <0.05, this indicates that the independent variables simultaneously have a significant effect on the dependent variable.

Table 11: Multiple Linear Regression

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.342561	0.238276	-0.478554	0.7657
NIM	0.415423	0.325476	2.599876	0.0132
NPL	0.432657	0.326548	0.458833	0.2134
EXCHANGE RATE	5.235443	3.435277	0.764335	0.5433
OIL PRICE	-0.342541	0.232257	-1.358865	0.7654
MARKET POWER	-0.123165	0.048636	-3.442315	0.0000
GENDER BDO	0.032265	0.786540	0.665487	0.6544
Effects Specification				
			S.D.	Rho
Cross-section random			0.457543	0.2265
Idiosyncratic random			0.034532	0.4322
R-squared	0.866414	Mean dependent var		0.032117
Adjusted R-squared	0.783367	S.D. dependent var		0.054877
S.E. of regression	0.432116	Sum squared resid		0.978321
F-statistic	3.543328	Durbin-Watson stat		1.012554
Prob(F-statistic)	0.009224			
Unweighted Statistics				
R-squared	0.542716	Mean dependent var		0.008753
Sum squared resid	0.765478	Durbin-Watson stat		0.387365

Source: Output Eviews, 2021

From Table 11 it can be seen that the Adjusted R2 value is 0.783367, greater than the Adjusted R^2 value in Table 11. this means that the variable in the form of Total Asset can increase the previous adjusted R2 value in Table 11 which shows an adjusted R^2 value of 0.583367. From Table 4.12, it is also obtained that the F test in this study has a coefficient value of 3.207973 with a prob (F-statistic) of 0.00 <0.05.

This shows that the independent variables (NIM, NPL, Oil Price, Exchange Rate, Market Power, and Female BOD Gender) and the moderating variable (Total Assets) jointly affect the dependent variable (Bank Risk).

6. Conclusion

Based on the results of research on the Effect of Net Interest Margin, Ownership Structure, Oil Prices, Market Power, and Gender BDO Women on Bank Risk with Total Assets as Moderation, it is concluded that: Net Interest Margin variable has an effect on Bank Risk. This means that an increase in Net Interest Margin will increase the value of Bank Risk in Go Public Commercial Banks listed on the IDX and KLSE. Non-Performing Loan (NPL) variable affects Bank Risk. This means that an increase in Non-Performing Loan (NPL) will increase the value of Bank Risk at Go Public Commercial Banks listed on the IDX and KLSE. The Rupiah Exchange Rate variable has an effect on Bank Risk. This means that an increase in Institutional Ownership will not increase the value of Bank Risk in Go Public Commercial Banks listed on the IDX and KLSE. The Oil Price Variable has no effect on Bank Risk. This means that an increase in oil prices will not increase the value of bank risk in Go Public Commercial Banks listed on the IDX and KLSE. The Market Power variable has no effect on Bank Risk. This means that an increase in Market Power will increase the value of Bank Risk in Go Public Commercial Banks listed on the IDX and KLSE. The Female BDO Gender variable has no effect on Bank Risk. This means that an increase in Female BDO Gender will not increase the value of Bank Risk in Go Public Commercial Banks listed on the IDX and KLSE. The total Assets variable has an effect on NIM, NPL, Oil Price, Exchange Rate, Market Power, and Female BOD Gender on Bank Risk in Go Public Commercial Banks listed on the IDX and KLSE.

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