



## World Oil Prices and Exchange Rates on Islamic Banking Risks

**Muhamad Nafik Hadi Ryandono<sup>1\*</sup>, Mochamad Ali Imron<sup>2</sup>, Muhammad Alkirom Wildan<sup>3</sup>**

<sup>1</sup>Department of Islamic Economic, Faculty of Economics and Business, Universitas Airlangga, 60286, Jawa Timur, Indonesia,

<sup>2</sup>Department of Management and Humanities, Universiti Teknologi PETRONAS, 32610, Perak Darul Ridzuan, Malaysia,

<sup>3</sup>Department of Management, Faculty of Economics and Business, Universitas Trunojoyo Madura, Bangkalan, Jawa Timur, 69162, Indonesia. \*Email: [muhhammadnafik@feb.unair.ac.id](mailto:muhhammadnafik@feb.unair.ac.id)

**Received:** 15 April 2022

**Accepted:** 05 July 2022

**DOI:** <https://doi.org/10.32479/ijeeep.13360>

### ABSTRACT

Islamic banking risks are influenced by many factors, facing internal and external banking risks. In this study, the internal banking risks are represented by Credit risk as measured by Non-Performing Financing (NPF) and liquidity risks as measured by Financing to Deposit Ratio (FDR). At the same time, world oil prices and exchange rates represent the external banking risks. World oil price data is obtained from OPEC Price, and exchange rate data is obtained from the Pacific Exchange Rate Service. While the data from NPF and FDR is obtained from BI Statistics of Sharia Banking. The results of this study found that world oil prices have a significant effect on credit risk and liquidity risk in Islamic banking. In contrast, the exchange rate only has a significant effect on credit risk in Islamic banking.

**Keywords:** Bank Risk, Oil Prices, Exchange Rates, Credit Risk, Liquidity Risk

**JEL Classifications:** E2, E6, F6, F4

## 1. INTRODUCTION

Starting from the world's concerns due to the failures experienced by the capitalist economic system, an Islamic economic system emerged with one of the products offered in the form of the Islamic banking system, as a way out of the problem (Abbass et al., 2022) explained that a Sharia bank is a bank that in carrying out its business activities such as distributing financing and various services in payment traffic using the principles of Islamic law. This is reinforced by law No. 21 of 2008, which states that "Sharia Commercial Banks are Sharia Banks that in their activities provide services in payment traffic."

In Indonesia, in recent years there has been a significant development in the number of Islamic banks. In 2006 there were only 3 Shari'a Commercial Banks (BUS) and 19 Shari'a Business Units (UUS), while in December 2021 there were already 14 BUSes, and 20 sharia laws. This increase will continue with the

implementation of Law No. 21 of 2008 which states the deadline for UUS to become a BUS in 2023, thereby encouraging the development of UUS on Conventional Commercial Banks to become BUS.

As a financial institution that has an intermediation function, the role of banks is very important in the economic activities of a country, where banks become fund-distributing institutions and as a place for financial transactions, this makes banks not change like a pulse in the human body, which is very much needed to support the smooth running of a country's economy. Therefore, efforts are needed as early as possible to anticipate various risks that exist in Islamic banking. This is important considering that in the case of the crisis in 1997/1998 many banks went bankrupt due to their low health levels. (Xiao et al., 2022) explained that in addition to capital problems and good corporate governance, low risk management capabilities are one of the weaknesses identified from the 1997/1998 banking crisis. According to data from Bank

Indonesia (BI) and IBRA, among others, as many as 71 banks were closed and 20 banks were merged so that the number of banks was reduced from 238 banks in October 1997 to 169 banks at the end of 2001 (Al-Khazali and Mirzaei, 2017; Che Ibrahim et al., 2022).

There are many factors that can affect the risks of Islamic banking, including internal banking factors and external banking (macroeconomic) factors. Efforts to minimize the risks of Islamic banking need to pay attention to the constantly fluctuating macroeconomic conditions. The exchange rate as one of the macroeconomic variables, since mid-2011, has experienced a depreciation trend. In June 2011, the rupiah exchange rate against the USD Dollar was Rp. 8,661 while in October 2021 it experienced a high increase, reaching Rp. 16,227. Furthermore, the macroeconomic variable that also often experiences shocks is the world oil price. This was seen in July 2008, the world oil price reached \$131.22/barrel, but in December 2021 it fell to \$61.66/barrel. Currently, there is a downward trend in world oil prices and it is feared that it will have an impact on Indonesia's macroeconomic conditions. It is undeniable that Indonesia is one of the oil exporting countries, if the decline in oil prices continues, it will insure investment flows to the oil and gas sector, decrease production and export revenues and result in a smaller contribution of the oil and gas sector to Indonesia's GDP (Wildan et al., 2021).

Based on this, research that discusses the impact of macroeconomic variable shocks on Islamic banking risks is important to do so that Islamic banks can immediately anticipate all negative effects that can increase various risks of Islamic banking. Therefore, the author is interested in conducting research that aims to determine the effect of oil price shocks and exchange rates on the risks of Islamic banking in Indonesia.

## 2. LITERATURE REVIEW

According to the Financial Services Authority Regulation number 8/POJK.03/2014, the application of risk management in banking operations is carried out against 10 risks, namely: credit risk, market risk, liquidity risk, operational risk, legal risk, strategic risk, compliance risk, reputation risk, return risk, and investment risk. In this study, the factors used by researchers to measure the level of risk in Islamic banking were credit risk as measured by NPF (Non-Performing Finance) and liquidity risk as measured by FDR (Finance To Deposit Ratio). This is done considering that credit risk and liquidity risk can be measured using a strong approach.

Oil is one of the main export commodities for Indonesia. The continuous decline in oil prices will have an impact on the Indonesian economy. This is because as an oil exporting country, Indonesia will certainly experience a decline in oil export performance. In addition, the decline in oil prices will also have an impact on reducing the realization of government revenues in the state budget. The downward trend in oil prices is caused by the oversupply of oil in the global market due to the removal of Iranian embargo sanctions and the absence of oil production cuts from oil-producing countries. This is also exacerbated by the weakening of the growth outlook in China, Japan, and the European Union (Subhan and Amanda, 2016) The decline in oil prices also has an

impact on the decline in prices of other mining commodities. This will have an impact on increasing the risk of bad debts and banking NPF figures in the mining portfolio. The impact of low oil prices on banks in Kuwait found that oil price movements have only a small impact on deposits and have no impact on credit growth. In contrast to the study, (Kertly de Medeiros et al., 2022; Xiao et al., 2022) found that the decline in oil prices had an impact on slowing down banking loans and deposits. The decline in oil prices also had an impact on increasing the bank's bad-cost ratio.

Furthermore, the decline in prices on oil and other mining commodities can be a warning for Islamic banks to be cautious in providing financing to the sector. This will have an impact on reducing the financing ratio provided by the banking sector and will increase the liquidity of Islamic banking.

An exchange rate is the price that appears when the currency of one Country is converted or exchanged for the currency of another Country (Utomo et al., 2021) added that the exchange rate of one currency affects the economy if the exchange rate of that currency appreciates or depreciates. The trend of the Indonesian currency exchange rate continues to increase the depreciation rate. This makes the value of the rupiah fall against foreign currencies. This condition will cause problems for economic activity actors who use imported raw materials. Depreciation of the rupiah will increase the price of raw materials and burden production costs so that it will reduce the income of these producers. This will eventually result in a jam loan payments to banks will thus increase the NPF ratio of banks. Research conducted by Che Ibrahim et al. (2022) found that the exchange rate has a positive relationship with the NPL ratio of banks. In contrast to these results, the research of (al Jabri et al., 2022; Al-Khazali and Mirzaei, 2017) which found that the exchange rate did not have a significant effect on banking NPF.

Exchange rate depreciation also has an impact on the decline in third party funds in Islamic banking due to the large number of customers who will withdraw their money to exchange for various products whose prices are increasing due to exchange rate depreciation (Long and Zhang, 2022). This condition is also exacerbated by Indonesia's high consumption of electronic products from abroad. If this continues, it will reduce the cash reserves and liquidity capabilities of Islamic banks. In this regard, research conducted by (Guo et al., 2022) which found that the exchange rate negatively affects the LDR of banks.

Based on the explanation above, the difference between this study and the previous research is that this study measures the risk of Islamic banking using 2 measurements, namely credit risk with NPF and liquidity risk with FDR. This contrast to previous studies that examined NPF and FDR banking separately. In addition, this study uses two independent variables, namely oil prices and exchange rates together to measure the level of risk in Islamic banking.

## 3. METHODS

The data used in this study are overall secondary data taken from official sources in monthly form starting from the period January 2009 to December 2021. The banking objects used are 14 BUS

and 20 UUS, shari'a banking data is accumulated in the aggregate without regard to the capacity of individual Islamic banks. World oil price data was obtained from OPEC Basket Price, exchange rate data was obtained from Pacific Exchange Rate Service, data from NPF and FDR were obtained from BI Islamic Banking Statistics (Martínez-Cañete et al., 2022).

The following Table 1 describes the operational definition of the variables that will be used in this study:

To find out the influence of independent variables on dependent variables is carried out by multiple linear regression. The regression analysis model used is the following:

$$NPF_t = \alpha + \alpha_1 * Oil_t + \alpha_2 * Ert + \alpha_3 * Ct + \epsilon$$

$$FDR_{it} = \alpha + \alpha_1 * Oil_t + \alpha_2 * Ert + \alpha_3 * Ct + \epsilon$$

### 4. RESEARCH RESULTS

The discussion of the results of this research will be preceded by the presentation of research data profiles and data conditions. The following Table 2 describes the condition of the research data.

Based on the Table 2, it is known that the entire variable has good data, and no data is of value extreme. This can be seen from the standard deviation value which is smaller than the value of Mean Each variable. Next here's a graph of theg describes the conditions of fluctuations in variable data of NPF, FDR, oil prices, and exchange rates (Figure 1).

Furthermore, it will be explained about the results of regression testing against research variables which will be described in the following Table 3:

Based on the Table 3, it is known that world oil prices and exchange rates have a negative and significant influence on credit risk as measured by Non-Performing Financing (NPF). The results of this study also found that the world oil price has a positive and significant influence on the Finance to Deposit Ratio (FDR), which is a parameter of liquidity risk in Islamic banks.

### 5. DISCUSSION

The negative influence of world oil prices on Non-Performing Financing (NPF) indicates that a decrease in world oil prices will have an impact on increasing credit risk in Islamic banks. This is because the decline in world oil prices has an impact on the decline in the prices of other mining commodities. The decline in oil prices has had a huge impact on oil and gas companies. If in some period there is still a decline in oil prices, it is feared that some oil and gas companies will collapse. This situation will eventually have an impact on increasing Islamic banking credit risk as measured by the increase in the non-performing financing (NPF) figure due to the portfolio in the oil and gas sector experiencing congestion. The relationship between world oil prices and Non-Performing Financing (NPF) can be further explained with the following chart (Figure 2):

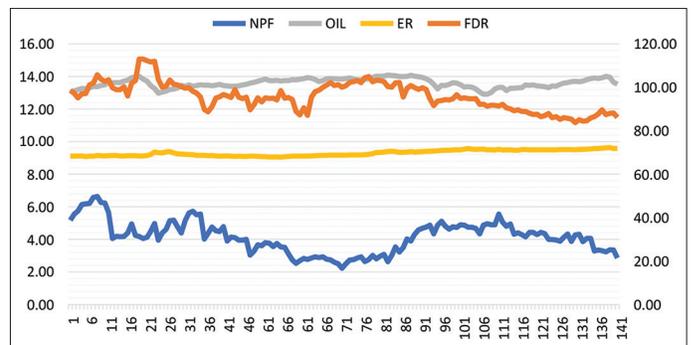
**Table 1: Definition of variables**

Variables	Description	Source
Oil price	The world oil Price in this study used the OPEC standard with the unit \$/Barrel and converted into rupiah/barrel units. Furthermore, the oil price data will be aligned with other variables with using a natural logarithm (LN)	OPEC price
Exchange rate	Exchange rates are a comparison IDR exchange rate against foreign currency (USD)	Bank Indonesia
Credit Risk	Non-Performing Loans NPF=x100%	Islamic Banking Statistics
Liquidity Risk	Total Credits FDR=x100%	Islamic Banking Statistics
Control Variables	Third Party Funds This study used several control variables consisting of inflation, Industrial Production Index (IPI), BI Rate, CAR, BOPO, and ROA	Bank Indonesia, BPS, and Islamic Banking Statistics

**Table 2: Research data**

Variable	Minimum	Maximum	Mean	SD
NPF	2.22	6.63	4.13	0.97
FDR	83.72	113.02	96.78	6.49
OIL	403,067.06	1,281,170.42	831,630.79	229,422.97
ER	8,623.00	16,227.00	11,091.38	2,016.99

**Figure 1: Variable conditions**



In the picture above, when there is a decline in oil prices, it is immediately responded to by the stalling of various financings engaged in the mining sector. This increases the non-performing financing ratio in Islamic banking. The findings of this study are supported by al Jabri et al. (2022) research which also found that the decline in oil prices had an impact on slowing down banking loans and deposits. Hence, al Jabri et al., (2022) concluded that the decline in oil prices would have an impact on increasing the bank's bad-bouncing ratio.

Furthermore, the results of this study also found that the exchange rate has a negative and significant influence on Non-Performing Financing (NPF) (Al-Khazali and Mirzaei, 2017). This indicates that when there is an increase in the price of the dollar against the rupiah, it will reduce the level of non-performing financing in Islamic banking. This condition is caused by the tightening carried

out by banks in disbursing financing to the foreign exchange sector in response to the weakening rupiah. In addition, entrepreneurs also braking in applying for foreign exchange financing because of the increased risk of mismatch exchange rate differences that increase, which has an impact on the cost of borrowing banks. This has resulted in a decrease in the value of Non-Performing Financing (NPF) in foreign exchange financing. The relationship between the exchange rate and Non-Performing Financing (NPF) can be further explained in the following chart (Figure 3):

Based on the chart, it is known that any shock that appears in the rupiah exchange rate against the dollar will be responded to by Islamic banks by reducing foreign exchange financing so that the credit risk of banks as measured by the value of Non-Performing Financing will decrease.

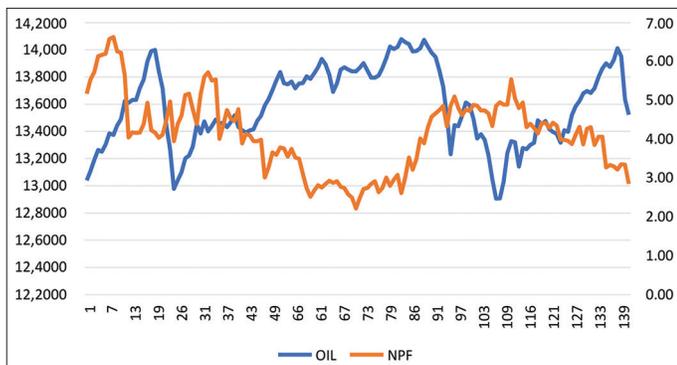
Furthermore, the results of this study found that world oil prices have a positive effect and significant against Finance to Deposit

**Table 3: Regression results**

Variables	(1)	(2)
	NPF	FDR
LN_OIL	-1.61*** (-7.61)	4,18*** (2.77)
LN_ER	-1.31** (-2.10)	4.86 (1.26)
INF	-0.16*** (-4.07)	0.76*** (3.36)
IPI	0.03*** (6.34)	-0.02 (-0.39)
BEER	0.41*** (6.66)	1.16*** (2.41)
CAR	-0.06** (-2.17)	-0.94*** (-6.98)
FDR	0.00 (-0.28)	
NPF		-0.16 (-0.28)
BOPO	0.01 (0.64)	-0.29*** (-3.64)
ROA	-0.46 (-2.61)	0.70 (0.64)
Constant	33,88*** (6,64)	20.98 (0.60)
Observations	147	147
R-squared	0.76	0.79

Info: \*\*\*P>0.05

**Figure 2: Relationship of world oil prices to non-performing financing**



Ratio (FDR) banking sharia. The Result indicates that the presence of The decline in prices on oil commodities will have an impact on the decline of several other mining commodities. This state will become a fairy willingness for Islamic banks to provide financing at sector. This will have an impact on reducing the financing ratio provided by the banking sector and will increase Islamic banking liquidity. These conditions will ultimately secure the banking from Risk Liquidity. Berikut chart illustrating the relationship between oil prices and Finance to Deposit Ratio (FDR).

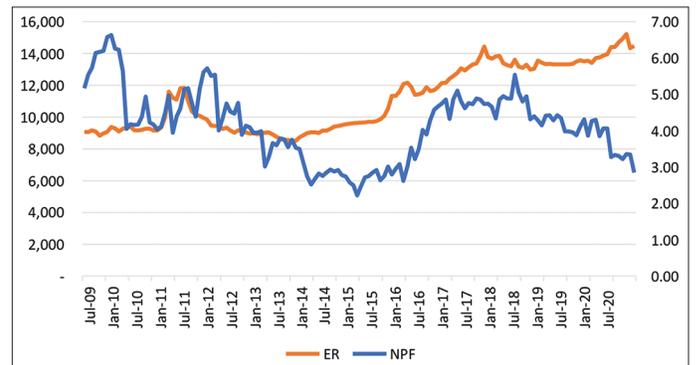
In Figure 4, you can see the positive response from the Finance to Desposit Ratio to changes in world oil prices. This condition explains that Islamic banking has always been cautious against all kinds of shocks to macroeconomic conditions that can risk Islamic banking.

The results of the study also found that the exchange rate had a positive but insignificant effect on the FDR of Islamic banking. This is due to the tendency of Islamic banks to provide financing to the real sector compared to financing in the foreign exchange sector. In addition, Bank Indonesia regulation in PBI No. 12/10/PBI/2010 concerning the net foreign exchange position of commercial banks, which explains that commercial banks are required to manage and maintain a net foreign exchange position of a maximum of twenty percent of the total capital owned by banks. This has an impact on the prudential attitude of Islamic banks in providing foreign exchange financing.

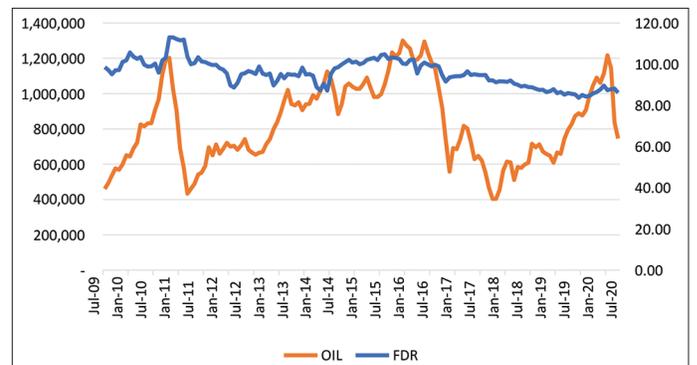
## 6. CONCLUSION

The conclusions that can be drawn in this study are that world oil prices and the rupiah exchange rate have a significant influence

**Figure 3: Relationship of exchange rates to non-performing financing**



**Figure 4: Relationship of world oil prices to finance to deposit ratio**



on Islamic banking risks as measured by Non-Performing Finance (NPF) in Islamic banking. Furthermore, this study also found that world oil prices have a significant influence on liquidity risk as measured by the Finance to Deposit Ratio (FDR) while the exchange rate does not have a significant influence on liquidity risk. Based on the results of the study, the advice that can be given in this study is that Islamic banks are expected to be cautious in disbursing financing to the oil and gas sector because the sector has considerable risks that can interfere with the health of Islamic banking.

## REFERENCES

- Abbass, K., Sharif, A., Song, H., Ali, M. T., Khan, F., Amin, N. (2022), Do geopolitical oil price risk, global macroeconomic fundamentals relate Islamic and conventional stock market? Empirical evidence from QARDL approach. *Resources Policy*, 77, 102730.
- Aljabri, S., Raghavan, M., Vespignani, J. (2022), Oil prices and fiscal policy in an oil-exporter country: Empirical evidence from Oman. *Energy Economics*, 111, 106103.
- Al-Khazali, O.M., Mirzaei, A. (2017), The impact of oil price movements on bank non-performing loans: Global evidence from oil-exporting countries. *Emerging Markets Review*, 31, 193-208.
- DeMedeiros, R.K., Besarria, C.D., De Jesus, D.P., DeAlbuquerque, V.A. (2022), Forecasting oil prices: New approaches. *Energy*, 238, 121968.
- Guo, J., Zhao, Z., Sun, J., Sun, S. (2022), Multi-perspective crude oil price forecasting with a new decomposition-ensemble framework. *Resources Policy*, 77, 102737.
- Ibrahim, C.K.I., Belayutham, S., Awuzie, B.O., Oke, A.E. (2022), Analysis of designers' prevention through design (PtD) competence in the construction industry: A study of Malaysia, Nigeria, and South Africa. *Safety Science*, 150, 105710.
- Long, S., Zhang, R. (2022), The asymmetric effects of international oil prices, oil price uncertainty and income on urban residents' consumption in China. *Economic Analysis and Policy*, 74, 789-805.
- Martínez-Cañete, A.R., Márquez-de-la-Cruz, E., Pérez-Soba, I. (2022), Non-linear cointegration between oil and stock prices: The role of interest rates. *Research in International Business and Finance*, 59, 101513.
- Utomo, S.J., Chuk's Mayvani, T., Imron, M.A. (2021), Coal energy and macroeconomic conditions. *International Journal of Energy Economics and Policy*, 11(4), 426-432.
- Wildan, M.A., Imron, M.A., Siswati, E., Rosyafah, S. (2021), Macroeconomic factors affecting natural gas export management. *International Journal of Energy Economics and Policy*, 11(1), 639-644.
- Xiao, J., Chen, X., Li, Y., Wen, F. (2022), Oil price uncertainty and stock price crash risk: Evidence from China. *Energy Economics*, 112, 106118.