

The Relationship of Macro-risk Indicators, Internal Factors, and Risk Profile of Islamic Banking in Indonesia

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Abstract. *This study is essential because Islamic banks have a higher NPF level than conventional banks and examine whether macroeconomic indicators (macro-risk), internal factors of banking (GCG-earnings-capital) risk profile correlate term Indonesian Islamic banking. The method used is the correlation analysis involving four macro-risk variables (Forex; BI rate; Inflation and GDP), three GEC variables (GCG; ROA, and CAR), and two risk profiles (FDR and NPF). The number of samples is the ten largest Indonesia sharia commercial banks with the 2011-2018 periods. This research finds that macroeconomic indicators positively correlate to non-performing financing (NPF). The GEC positively correlates to NPF and FDR; GEC is negatively correlated to macro-risk indicators. However, some indicators are negatively correlated, such as GDP-corporate governance, Forex-profitability, GDP-efficiency, BI rate-capital, and profitability-NPF. The study proposed managerial implications to understand the relationship between macroeconomic, internal factors, and risk profile in Islamic bank lending.*

Keywords: *Islamic bank, macroeconomic, bank health, non-performing financing*

JEL: D02; G21, G32

Abstrak. *Latar belakang penelitian adalah adanya fenomena tingkat NPF bank syariah relatif lebih tinggi dari bank konvensional. Studi ini meneliti apakah indikator makroekonomi (risiko makro), profil risiko dan faktor kesehatan perbankan (GCG-pendapatan-modal yang dikenal sebagai GEC) memiliki korelasi dalam perbankan syariah Indonesia. Metode penelitian yang digunakan adalah analisis korelasi yang melibatkan empat variabel risiko makro (Valas; BI rate; Inflasi dan PDB), tiga variabel indikator kesehatan bank (GCG; ROA, dan CAR) dan profil risiko yaitu FDR dan NPF. Sampel berjumlah sepuluh bank umum syariah terbesar di Indonesia dengan periode 2011-2018. Kami menemukan bukti yang konsisten bahwa indikator ekonomi makro berkorelasi positif dengan pembiayaan bermasalah, RGEC berkorelasi positif dengan pembiayaan bermasalah dan RGEC berkorelasi negatif dengan indikator risiko makro. Namun, beberapa indikator berkorelasi negatif seperti GDP-corporate governance, Forex-profitability, GDP-efficiency, BI rate-capital dan profitability-NPF. Implikasi managerial studi ini adalah memahami korelasi antara makroekonomi, faktor-faktor internal dan profil risiko dalam pembiayaan bank syariah.*

Kata Kunci: *bank syariah, makroekonomi, kesehatan bank, pembiayaan bermasalah*

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Introduction

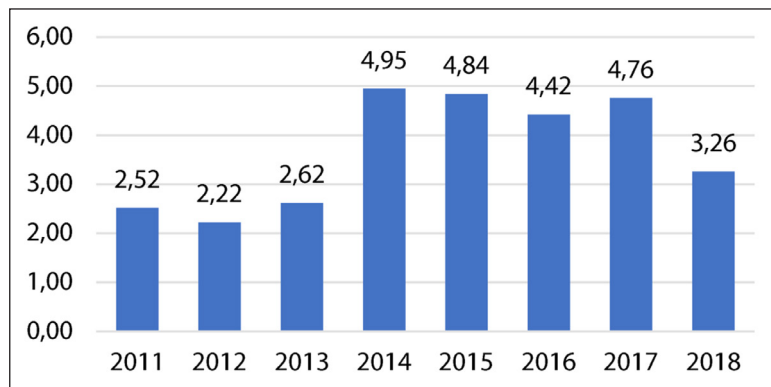
The stability and health of the Islamic banking system in Indonesia have become critical after the global financial crisis of 2008. Funding liquidity is considered a critical factor that plays an essential role in bank stability but, at the same time, is a significant determinant of the banking crisis (Hugonnier & Morellec, 2017). The function of banking in the economy is crucial because it controls the fund's distribution from the public (third party) to businesses that require it as one of the leading national economic drivers; thus, the function of banking as intermediation or "heart of the economy" (Apriadi et al., 2017). The development of the Islamic banking industry and financial institutions, both conventional and sharia, follows the corporation's fundamental performance and fluctuations in global, regional, and national economic conditions generally (Santosa, 2011). Thus, Islamic banking's performance and health cannot be separated from internal and external factors because the banking industry always influences by economic conditions in the real sector (Ijaz et al., 2020).

The national banking industry controls around 93 percent of the total national financial assets, of which around 5.3 percent is Islamic banking assets, so if there is a disruption in the banking system's performance or health, it will have a broad impact on the national economy. This role is related to banking as a general intermediary to distribute funds from the financial sector to the real sector. So if there is a shock on macroeconomic factors that will directly or indirectly impact the financial sector and the real sector, banks as intermediaries of the two sectors will also be affected. Thus the function of banking as a "heart of the economy" will also be disrupted (Apriadi et al., 2017; Jacoub et al., 2020).

In general, the Islamic banking risk profile measure through financing deposits ratio (FDR) and non-performing financing (NPF). Where the higher the value of the FDR and the NPF indicates the higher banking risk. Throughout the 2011-2018 period, the NPF value of Islamic banks fluctuated between 2.22 to 4.95%. In general, the NPF trend in sharia banking is not very good because most of it is still above 3.0%. The worst NPF appeared in the 2014-2017 period, which was 4.42% -4.95%. However, in 2018 there was a significant decrease in NPF from 4.76 in 2017 to 3.26 in 2018. The average NPF rate is still far above the conventional banking NPL that is generally below 3.0%.

According to data from the Directorate of Islamic Banking of Bank Indonesia (BI DPBS), the NPF Islamic banking level in 2014 showed 4.95%, and in 2017 NPF is at 4.76%. This figure presents that a very high NPF number indeed triggers Islamic banking risk because it almost touches the NPF that the central bank allows, namely 5.0%. The economic turmoil that is affected by global uncertainty triggers an increase in the value of the USD, a more significant CAD deficit, an increase in inflation, which then has implications for the decline in the value of Gross Domestic Product (GDP). National GDP growth also tends to decline, which in 2017 notes at 5.07%. Inflation also continued to decline with the national economic slowdown accompanied by a decrease in the benchmark interest rate (BI rate) to 4.25%.

Figure 1. Non-performing financing of Indonesian Islamic banking



Source: OJK (2019)

However, the weakening of IDR-USD has forced BI to increase the BI rate to 5.50% within four months. This policy's impact is that the real sector will worsen because entrepreneurs cannot afford to repay loans to banks due to high-interest rates. On the other hand, this will also reduce the country's purchasing power, where this condition will make economic stability stable, which will increase the NPF value of Islamic banking so that the risk of the profile is increasingly dangerous or fragility (Apriadi et al., 2016).

Some factors that are directly affected by financing problems include the risk profile, governance, earnings (earnings), and capital (capital), which summarize in the rating of which is known as RGEC (Risk Profile, Good Corporate Governance, Earnings, and Capital). The RGEC method takes effect on January 1, 2012, following PBI No. 13/1/PBI/2011 to measure the level of banking health as a substitute for bank health gauges, namely CAMELS. However, the RGEC guidelines for Islamic banks only implements according to POJK No. 8/03/2014, whose substance is similar to RGEC PBI No. 13/1/PBI/2011. These aspects use financial ratios as a basis for assessment (Umiyati & Faly, 2015).

The NPF of Islamic banking is relatively high has triggered a level of risk to bank management because the bank's health is lower and can become a failed bank. Quality financing is one source of problems that often occur because customers fail to meet payment commitments that cause losses to Islamic banks (Santoso et al., 2019). The high NPF indicates account attitudes, financial statement attitudes, business activity attitudes, customer attitudes, and macro-risk attitudes. Furthermore, Santoso et al. (2019) and Setiawan & Monita (2013) explain that the factors that cause non-performing financing (NPF) cause by three elements, namely the Islamic bank (the creditor), the customer (the debtor), and other parties (other parties).

As we know, internal and external factors influenced NPF, including the creditor, debtor, and other parties mentioned above. Internal factors are micro-fundamental variables, namely corporate governance, earnings (profitability and efficiency), financing debt ratio, and capital. The macro-risk factors are macroeconomic variables that are difficult to control by Islamic banking and have a more significant influence than internal factors (Umiyati & Faly, 2015; Anggraeni, 2010). Moreover, macro-risk variables that can increase Islamic

banking's risk profile are the IDR-USD exchange rate, BI 7-day repo rate (BI rate) as the benchmark interest rate, inflation, and economic growth (Firmansyah, 2014).

Inflation is a symptom of rising prices of goods that are general and continuous. From these definitions, three components must fulfill so that inflation can be said to increase prices, in general, and to persist. GDP is the value of final goods and services based on market prices produced by an economy in a period using production factors located in that economy (Mishkin & Eakins, 2012). Umiyati & Faly (2015) and Leka et al. (2019) argue that inflation's adverse effects also make GDP value decline. This decline will then affect the decline in domestic savings. In the end, banks as intermediary institutions will lose their sources of investment funds. This situation will undoubtedly put the banking sector's soundness in a dangerous position (Jacoub et al., 2020b). Banks will experience a decline in capacity marked by slowing growth in fundraising, which will reduce the distribution of financing by Islamic banking. This situation is an empirical fact of how an economic factor shock affects banking's health, both conventional and sharia (Apriadi et al., 2017; Muthamimah, 2014).

The relationship of macroeconomic variables (inflation and GDP) and internal variables (NPF), which become the theoretical framework in this study, refers to the theory that explained the relationship between macroeconomic variables and financial and banking stability (Mishkin & Eakins, 2012). The relationship begins with the emergence of shocks on macroeconomic variables (inflation, exchange rates, and GDP). The turmoil that occurred in these macroeconomic variables caused the debtor's asset price to decline. The decline has the potential to cause debtor business problems so that installments and default of principal payments. The failure of the debtor's business makes them unable to repay loans to the bank, which will increase the NPF so that the bank loses money.

In the previous study, Anggraeni (2010) and Santosa (2011) examined the impact of NPF and external factors (GDP and inflation) on the soundness of the Islamic banks period January 2004-April 2007. The analytical methods used were fishbone analysis and rank correlation Spearman. This research shows that NPF only affects 19% of the overall Islamic bank health calculation. The finding also states that NPF has a positive correlation to the APM ratio, and the ratio of GDP has a positive correlation with BOPO. Other findings indicate that the CAR, APM, and APYD ratios on Islamic banks are problematic.

Corporate governance (CG) and agency theory play a vital role in Islamic banking because of agency theory define the conflicts of interests between the managers and investors (shareholders and bondholders) due to conflicts of interest between owners and managers, debtor and managers, owner and debtor agency costs may increase. CG principles in the future back an approach that balances the legal, interest, and expectations of its stakeholders in an ethical, sustainable manner as part of its decision-making comprehensively (Jacob, 2019; Dzingai & Fakoya, 2017). Besides, corporate governance is more fundamental as it influences the bank's performance, which eventually determines the bank's position in the capital market, because the influence of macroeconomics on corporate governance assumes crucial and significance (Jacob, 2019).

Some previous studies present that among the crucial factors affecting NPL are economic growth, which negatively correlates with the NPL and NPF. Similar studies have found that macroeconomic factors have a significant relationship with NPL and NPF (Alzoubi, 2017; Do et al., 2020). Khemraj & Pasha (2009) stated GDP with a negative impact, but interest rate, inflation, forex, and excessive lending positively correlate with the increase of NPL and NPF. Apriadi et al. (2017) found a negative relationship between NPL and NPF and GDP growth and inflation, but a positive relationship with unemployment. Leka et al. (2019) and Donath et al. (2014) found that the real GDP growth rate and inflation rate- CPI determined bad loans in the banks from Central and Eastern Europe negatively affect the unemployment rate a positive effect.

Santosa (2011) and Pratiwi (2016) find that internal and macroeconomic factors influence corporate governance compliance. Forex and BI rates positively correlated with GCG, but conversely, inflation rates and economic growth negatively impact GCG. Some previous studies proved that macroeconomics factors as external risk influence to corporate governance compliance in bank managerial (Warrad & Khaddam, 2020; Zhang et al., 2019; Mukhibad et al., 2020).

Al-Homaidi et al. (2018) and De Leon (2020) found that the macro-risk indicators such as GDP, inflation rate. Interest rates have a significant correlation with earning or profitability. Duraj & Moci (2015) supported this finding that stated the macro-risk factors have a relationship with earning, especially ROE, NIM, and efficiency. Kusuma & Atahau (2019) and Kartikasary et al. (2020) found that sharia banking in Indonesia more efficient because of the macroeconomic condition and political stability. However, internal factors still dominance influence earning.

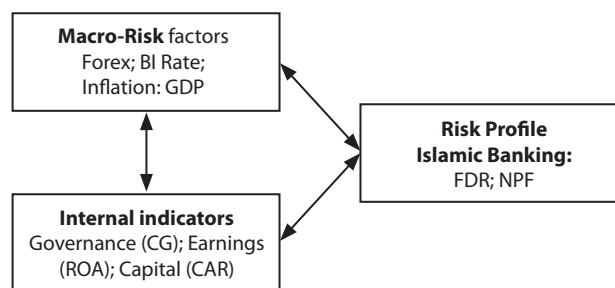
Hugonnier & Morellec (2017) and Santosa (2011) explained that macroeconomic factors significantly influence sharia bank capital, especially the capital adequacy ratio. Forex is negatively correlated with CAR, while BI rate and inflation are positively related to banks' capital. Moreover, Firmansyah (2014) found also that the capital of banks correlated to external factors dynamics. Moreover, Jacoub et al. (2020) and Al-Homaidi et al. (2018) found that non-performing financing correlated to capital, assets, management, earnings, and liabilities, especially financing deposit ratio, corporate governance index, earning, and capital of Islamic bank. These findings support by some previous studies such as Mukhibad et al. (2020), Abbas et al. (2019), and Yehorycheva et al. (2017).

The internal factors and macro-risk information are the critical roles played in Islamic banking's risk profile level yet well documented. The research gap in this area, especially in an emerging market, is GEC's correlation, macro-risk factors and risk profile, and differences in regulation and enforcement regime to sharia finance. The high-risk Islamic banking profile indicates the relationship of account attitudes, financial statement attitudes, business activity attitudes, customer attitudes, and macro-risk attitudes, including the role of debtors, creditors, and other parties involved. Therefore, the correlation of risk profile, forex, inflation, and economic growth rates to the GEC variable (GCG, earnings, and capital) in Islamic banks is the primary identification problem examined in this study with the 2011-2018 financial reporting period.

Methods

This research-based on quantitative data with sources that used in the analysis of this study covering the period 2011-2018, which that considered to be quite representative for correlation analysis and comparative studies: First, quarterly financial statements (statement of financial position/balance sheet, income statement, a summary of the finance period: 2011-2018. Second, financial statistics Indonesia and Central Bureau of Statistics (BPS): GDP, Inflation, Exchange Rate (forex IDR-USD) 2011-2018. Third, the sample used is the top ten Islamic banks, namely: Bank of Sharia Mandiri, Bank of BNI Sharia, Bank of BCA Sharia, Bank of Bukopin Sharia, Bank of Muamalat Indonesia, Bank of Mega Sharia, Bank of Victoria Sharia, Bank of Panin Sharia, Bank of Maybank Sharia, and Bank of BRI Sharia.

Figure 2. Method of correlation analysis



This research uses appropriate, relevant methods to explain statistical predictions' accuracy to test research hypotheses. Literature studies and previous studies have revealed that the accuracy of model predictions determine by selecting variables and the validity of this study. The statistical method uses to determine the correlation between variables and how strong one variable affects the other variables. This test is needed to test the significance of the influence of these variables too. This research using Kolmogorov Smirnov to test the data normality. Furthermore, to test whether there is a correlation between macro-risk factors, internal factors, and risk profile of Islamic banking using the Spearman rank correlation coefficient (if the data is not normally distributed) or Pearson Product Moment correlation (data normally distribute). The framework of analysis describes in Figure 2.

The variables in this study is describing in Table 1. This study used the Pearson product-moment coefficient of correlation between Macro-Risk, GEC, and risk profiles such as FDR and NFP, which follows the following stage: First, collecting secondary data of sharia banking quarterly financial statement and macroeconomics factors. Second, calculating the ratio of all internal variables and risk profile. Third, test the normality of all variables to decide the parametric or non-parametric analysis. Fourth, analyzing the relationship between three main factors, namely Macro-risk, internal indicators, and risk profile. Fifth, testing of the Kolmogorov Smirnov test was used to determine the method of parametric analysis (normally distributed) and non-parametric (not normally distributed). Sixth, the Pearson test uses correlation analysis between the three factors variables to find how strong the

relationship between variables (Pearson product-moment coefficient of correlation). Seventh, summarizing the findings of the statistical analysis and discussion.

Tabel 1. Variables description

Variable	Measurement	Unit	Scale
Macro-risk:			
Exchange rate	Ln of JISDOR (IDR-USD)	IDR	Interval
BI rate	BI-7 day Reverse Repo	Percent	Ratio
Inflation rate	CPI Inflation rate	Percent	Ratio
GDP	GDP growth	Percent	Ratio
Internal:			
Corporate governance	GCG component matrix (1-5)	Rating	Ordinal
Earning	Net income to total assets	-	Ratio
Capital	Paid-in-capital to risk weighted assets	-	Ratio
Risk profile:			
Financing-deposit ratio	Total Financing to deposit ratio	-	Ratio
Non-performing financing	Non-performing financing to total financing	-	Percent

Result and Discussion

Normality testing aims to test whether the residual variable correlation model has a normal distribution. If the test results are typical, the correlation analysis uses the Pearson correlation method, and if the data is declared abnormal, then Rank Spearman correlation analysis will be used. Normality testing of all external and internal factors including macro-risk variables, namely: IDR-USD exchange rate (Forex); Reference interest rate (BI Rate); Inflation and Economic Growth Rate (GDP Growth). In contrast, internal factors include several variables such as risk profile, corporate governance, earnings, and capital (notated NPF; FDR; GC; ROA; BOPO, and CAR). The normality test results using the Kolmogorov-Smirnov One-Sample Test provide the results, as shown in Table 2.

Table 2. Normality testing of research variables

One-Sample Kolmogorov-Smirnov Test				
		Unstandardized Residual	Unstandardized Residual	Unstandardized Residual
N		8	8	8
Normal Parameters ^{a, b}	Mean	.00 million	.00 million	.00 million
	Std. Deviation	.12309399	.03481740	.11846032
Most Extreme Differences	Absolute	.260	.114	.197
	Positive	.260	.098	.197
	Negative	-.194	-.114	-.128
Test Statistic		.260	.114	.197
Asymp. Sig. (2-tailed)		.20 ^c	.200 ^{c, d}	.200 ^{c, d}

Source: Data processed

Table 2 presents the significance value of 0.120 for model 1, which shows that the data is normally distributed by $0.120 > 0.05$. The significance value in model 2 obtains of 0.200, so the data is normally distributed. Then for model 3, the significance value is 0.200, which indicates that the data is normally distributed. Thus, all the data tested shows a significance value above 0.05, which means it shows a normal distribution so that the correlation analysis can use the Pearson correlation.

The correlation between macro-risk and risk profile

Pearson correlation analysis shows that almost all correlations between proxy risk profiles and macro risk are significant, except inflation with NPF. Correlation between financing to deposit ratio (FDR) with Forex (USD-IDR) shows the correlation -0.641 and significant at $\alpha=5\%$. While the Forex correlation with Non-Performing Financing (NPF) presents different results that positively correlated with the value of 0.675, this analysis shows that the Forex correlation with FDR and NPF is inversely proportional both are a proxy of risk profiles, as shown in Table 3. Forex negatively correlates with FDR, because if the value of forex increases, the public’s interest to buy USD will increase so that there will be a withdrawal of funds from Islamic banking (Santoso et al., 2019; Khemraj & Pasha, 2009). Whereas, the Forex correlation with NPF is positive because the increase in the IDR-USD exchange rate will increase business risk and investment risk so that the debtor will have difficulty paying the loan installments, which causes an increase in NPF (Al-Homaidi et al., 2018).

Table 3. Macro-risk and Risk profile correlation

Macro-Risk	Risk Profile			
	FDR	Results	NPF	Results
Forex	-0.641	significant	0.758	significant
BI Rate	0.361	significant	0.035	significant
Inflation	0.518	significant	-0.203	not significant
GDP growth	0.064	significant	0.048	significant

Source: Data processed

The analysis of the correlation of the BI Rate benchmark interest with the proxy risk profile also shows the opposite correlation in which the BI Rate correlation with FDR shows 0.361 and is significant while the BI Rate correlation with NPF is 0.035 and significant. These findings indicate that the correlation BI Rate by FDR and NPF equally positive but the magnitude of the correlation coefficient is different where FDR with BI rate is more reliable than the correlation NPF with the BI rate, though both are a proxy of risk profile as shown in Table 3. This result is due to the increase in The BI rate will increase the risk of default, which is getting higher so that the FDR and NPF will increase (Klein, 2013; Asnaini, 2014).

The other finding presents that the correlation between inflation and risk profile is the opposite result. As well as the correlation of Inflation with FDR is positive with a value of 0.518. However, the different results show by the negative and not significant relationship between NPF and FDR. When inflation rises and below 10% will increase FDR because economic growth is also improving under the research of (Setiawan & Monita, 2013). Furthermore, the correlation between economic growth and proxy GDP growth shows a harmonious and significant result in which GDP growth with FDR positively correlates with a value of 0.627. The correlation with NPF is also significantly positive, with a significant coefficient of 0.923. Economic growth will trigger the growth of Islamic bank financing so that FDR increases, and increasing financing will also increase the risk of default, so NPF rises (Al-Homaidi et al., 2019; Donath et al., 2014).

The correlation between macro-risk and corporate governance

The backbone of corporate governance is agency theory correlated to external factors like macroeconomic risk such as foreign exchange, interest rate, inflation rate, and economic growth. It is one of the main theories to figure corporate governance (Pratiwi, 2016; Ikram et al., 2016; Warrad & Khaddam, 2020). The correlation between macro-risk and corporate governance is in line with the hypothesis, except the relationship between forex and GCG. The macro-risk such as BI rate, inflation, and GDP growth is significant with coefficient 0.036, -0.247, and -0.932, respectively (see Table 4).

Table 4. Macro-risk and Governance correlation

RGEC	Corporate Governance	
Macro-Risk	GCG	Results
Forex	0.795	not significant
BI Rate	0.036	significant
Inflation	-0.247	significant
GDP Growth	-0.932	significant

Source: Data processed

These findings could mean: macroeconomic stability, especially BI rate and economic growth, has been changed by public governance reforms, which spilled over to the corporate governance area. Some references call this the statutory reform effect (Mukhibad et al., 2020). Second, macroeconomic stability positively affects banks' investment in corporate governance quality that calls the voluntary reform effect. These findings substantiated the following areas: (i) the effectiveness of OJK and Bank of Indonesia as regulatory authorities; (ii) Islamic banking disclosure, compliance, and transparency rules; and (iii) the quality of the controlling and enforcement (Ugur & Ararat, 2006; Warrad & Khaddam, 2020 and Mukhibad et al., 2020).

The correlation between macro-risk and earnings

Table 5 presents the correlation between earning or profitability to Macro-risk aspects. The correlation between Forex or IDR-USD exchange rate with return on assets (ROA) shows a significant result of -0.681. While efficiency has a correlation of 0.780 and significant, the IDR’s declining value will reduce purchasing power and thus harm the country’s investment and economy. The decline in the exchange rate will reduce the financing of Islamic banking, which ultimately harms its earnings (Duraj & Moci, 2015; Setiawan & Monita, 2013).

The correlation between the BI rate as the benchmark interest rate and Earning shows a positive and significant result where the BI rate with ROA is 0.041, and the correlation of the BI rate with efficiency (operating expense to operating revenue) is 0.028. This finding shows that an increase in the BI rate will increase the ROA and efficiency of Islamic banking due to increased profit sharing.

Table 5. Macro-risk and Earnings correlation

RGEC		Earning		
Macro-Risk	ROA	Results	Efficiency	Results
Forex	-0.681	significant	0.780	not significant
BI Rate	0.041	significant	0.028	significant
Inflation	0.231	significant	-0.154	not significant
GDP Growth	0.883	significant	-0,840	significant

Source: Data processed

Furthermore, the correlation between the inflation rate and ROA shows a significant value of 0.231, but the correlation between inflation and efficiency is precisely the opposite of -0.154, but not significant. This result is supported by (Apriadi et al., 2016). The correlation between economic growth (GDP growth) shows that the higher GDP growth, the higher the ROA will be with a high coefficient of 0.883. Likewise, the correlation between economic growth and efficiency find to be the opposite in which the increase in GDP would reduce the efficiency with the coefficient of -0.840 that is in-line the previous findings (Mukhibad et al., 2020; Umiyati & Faly, 2015; Setiawan & Monita, 2013).

The correlation between macro-risk and capital

Correlation analysis between Macro-risk and Capital aspects represented by the Capital Adequacy Ratio (CAR) show in Table 6, where forex has a positive correlation with the CAR value with a correlation coefficient of 0.490. The increase in the IDR exchange rate indicates a strengthening of the economy and national competitiveness, opening opportunities for capital strengthening (Umiyati & Faly, 2015; Hugonnier & Morellec, 2017). While the correlation between the benchmark interest rate or BI rate

by CAR shows insignificantly - 0.451, then the BI rate increase will reduce the Islamic banking capital.

Moreover, the correlation analysis results between Inflation and CAR are similar to the BI rate-CAR correlation, which is a negative correlation with a value of -0.465. This result is because an increase in inflation will trigger a rise in the BI rate, negatively impacting CAR. The correlation between GDP growths with CAR is in line with the correlation of the BI rate-CAR and CAR-Inflation, which is negative and significant at the amount of -0.306 due to an increase in financing optimizes reducing CAR. These findings are in-line with some previous studies (Ikram et al., 2016; Hugonnier & Morellec, 2017; Firmansyah, 2014).

Table 6. Macro-risk and capital correlation

RGEC	Capital	
Macro-Risk	CAR	Results
Forex	0.490	significant
BI Rate	-0.451	significant
Inflation	-0.465	significant
GDP Growth	-0,306	significant

Source: Data processed

The increasing exchange rate (IDR-USD) indicates a strengthening of the economy and national competitiveness, opening opportunities for capital strengthening (Mukhibad et al., 2020). While the correlation between the reference interest rate or the BI rate with CAR shows the results of a negative relationship, then the increase in the BI rate will reduce the Islamic banking capital (Al-Homaidi et al., 2019). Furthermore, the correlation analysis results between Inflation and CAR are similar to the BI rate-CAR correlation, which is a negative correlation. An increase in inflation will trigger a rise in the BI rate, which negative effect on CAR.

The correlation between RGEC and non-performing financing

Correlation analysis between Risk Profile (FDR), Governance (Governance), Earning and Efficiency (ROA and efficiency), and Capital (CAR) with Unhealthy Financing (NPF) shows in Table 7. The first correlation between FDR with a positive NPF is 0.638, where an increase in FDR will increase the NPF due to an increase in the amount of financing that can increase the risk default risk. The correlation between NPF and GCG shows a positive relationship where an increase in NPF will improve the quality of GCG implementation by Islamic banking management, where this finding is following (Firmansyah, 2014). Thus increasing NPF will trigger better governance efforts to avoid a higher risk of NPF.

Table 7. RGEC and Non-performing Financing correlation

RGEC	Risk Profile		Governance	Earning		Capital
	FDR	NPF	GCG	ROA	Efficiency	CAR
NPF	0.638	1	0.899	-0.988	0.634	0.169
Results	Sig 0.10		Sig 0.05	Sig 0.01	Sig 0.10	not significant

Source: Data processed

Furthermore, the correlation between NPF and ROA produces a negative relationship of -0.988 so that an increase in NPF will reduce the profitability of Islamic banking. In contrast, the correlation of NPF with efficiency is positive 0.634, where an increase in NPF will increase efficiency, while the correlation of CAR with Capital in this case CAR is insignificant that in-line with some previous studies (Muthamimah, 2014; Hugonnier & Morellec, 2017; Jumono et al., 2020; Mukhibad et al., 2020). Analysis of the relationship between FDR and NPF is positive, where an increase in FDR will increase the NPF due to an increase in the amount of financing that can increase the risk of default (Santosa, 2011). The correlation between NPF and GCG shows a positive relationship where an increase in NPF will improve the quality of GCG implementation by Islamic banking management. Thus increasing NPF will trigger better governance efforts to avoid a higher risk of NPF. Furthermore, the correlation between NPF and ROA results in a negative relationship so that an increase in NPF will reduce the profitability of Islamic banking (Santoso et al., 2019). At the same time, NPF correlation with ROA is positive and will improve efficiency (Santosa, 2011; Alshammari, 2017; Dahir et al., 2019).

Conclusion

The Macro-risk and risk profile analysis find that the exchange rate or forex has a negative correlation with FDR and conversely has a positive correlation with NPF. This result is following the theory where the correlation between FDR and NPF is negative. The higher USD exchange rate can increase the NPF value due to the higher potential for bad credit. The BI Rate with the risk profile of FDR and NPF has a positive correlation, but the BI Rate correlation with FDR is much stronger than the correlation of the BI Rate with NPF. So, in general, the increase in the BI Rate can trigger a decline in the health of Islamic banking. Next, the inflation rate is positively correlated with FDR but does not correlate with NPF. Furthermore, both FDR and NPF’s correlation between economic growth and risk profile is relatively high and positively significant. Thus economic growth can trigger a decline in the level of health of Islamic banks.

Correlation between Corporate Governance (GCG) and Macro-Risk shows different results where there are some insignificant correlations, namely Forex and Inflation. The correlation between Forex and GCG is not significant. It shows that Forex and GCG relations have no meaning. Then GCG has exhibited a significant correlation with the BI Rate with positive coefficients were small. It means that every increase in the BI rate would respond with the increasing value of GCG as an increased awareness of Islamic banking.

At the same time, GCG also finds it to be negatively correlated with inflation so that with increasing inflation, the governance of Islamic banking loosened. While the correlation of economic growth to GCG is negative and significantly and presents that good economic growth will reduce the quality of corporate governance in sharia banking.

Analysis macro-risk and earnings find that the correlation between the exchange rate and return on assets (ROA) is negative and significant. While with efficiency (OCOI), the correlation was significantly positive. The declining value of the IDR will reduce purchasing power and thus hurt its investment and economy. The decline in the exchange rate will reduce the financing of Islamic banking, which ultimately harms profit. The correlation between the BI rate as the benchmark interest rate and ROA shows positive results, and the correlation between the BI rate and efficiency is also positive. This finding shows that an increase in the BI rate will increase the ROA and efficiency of Islamic banking due to increased profit sharing.

Furthermore, the correlation between the inflation with the ROA shows the value of a positive but inflation correlation with efficiency insignificantly. The correlation between economic growth (GDP growth) shows that the higher GDP growth, the higher the ROA will be with a high coefficient. Similarly, the correlation between economic growth and efficiency is the opposite, where increasing GDP will reduce efficiency so that Islamic banking efficiency decreases.

The managerial implication for Islamic banking management should be concerned, especially about macroeconomic indicators, risk management, and the correlation of internal factors and risk profile. The procedures of financed risk management have to be appropriate. To obtain a reasonable risk profile management process, the bank needs to establish corporate governance and reasonable financed risk criteria, appropriate authority personal, and risk appetite of Islamic banking. Credit risk management policies also couple with economic indicators and internal factors such as governance, earning, and capital. Besides, the growth of credit, high-risk lending, and consumption need to monitor to ensure sharia compliance during each period regularly.

This study's limitation is only the use of correlation analysis and secondary data from the financial statements of firms and regulators such as the Bank of Indonesia, and BPS (Central body of Statistic) that are published, quarterly. Future research suggests using the regression model, panel analysis and/or GMM with adding period for completing this study. The primary data from interviews and questionnaires for practitioners and experts are using for finding verification.

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