The Effect of Credit Risk, Liquidity Risk, and Bank Capital on Bank Profitability During the COVID-19

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Abstract  
This research aims to examine the impact of credit risk, liquidity risk, and bank capital on profitability banks in Indonesia and Malaysia during the global economic crisis of Covid-19 using panel regression analysis methods by E-views software. The research sample was 232 observational data for Indonesian banking and 64 observational data for Malaysian banking that were gained with purposive sampling method from 2020-2021 quarterly. The results of this study: are credit risk has a significant and negative impact on the profitability of Indonesian banks but has no effect on the profitability of Malaysian banks; liquidity risk has a significant and positive impact on the profitability of Indonesian banks but has no effect on the profitability of Malaysian banks; and bank capital does not affect the profitability of Indonesian and Malaysian banks.

Keywords: banking profitability, bank capital, credit risk, covid-19, liquidity risk

INTRODUCTION

The Covid-19 pandemic has caused the economic crises and Indonesia has been listed as one of the countries infected by the Covid-19 pandemic since March 2020 (Fadli, 2021). The banking sector is one of the most vulnerable sectors because the majority of economic activity is linked directly or indirectly to the bank (Banna & Alam, 2021). An economic crisis produces chaos and potentially brings great losses to the banking system because the banking industry has a big risk of declining profitability, especially in profitability (Abdelaziz, et al, 2020; Banna and Alam, 2021).

The emergence of the pandemic Covid-19 brings decreased profitability growth in Indonesia. Based on Statistik Perbankan Indonesia 2021, the Net Interest Margin (NIM) ratio
of conventional banks in Indonesia was 4.8–4.9% in January and February 2020 (before the pandemic), but decreased to 4.3% since March 2020. During April 2020 until December 2021, the NIM ratio couldn’t back to normal to be the same as that before the pandemic. The detailed fluctuation of the NIM ratio is presented in figure 1.

![Net Interest Margin Ratio Fluctuation on Indonesian Conventional Banks](source)

**Figure 1. Net Interest Margin Ratio Fluctuation on Indonesian Conventional Banks**

Several studies were conducted to examined the effect of credit risk, liquidity risk and bank capital on bank profitability especially during global economic crisis in 2018 (Adelopo, *et al.*, 2018; Rossi *et al.*, 2018; Abbas, *et al.*, 2019), but there are still lack of study in global economic crisis due to the Covid-19 pandemic. The existed research were focused on Mena region (Abdelaziz, *et al.*, 2020) and developing countries such as Uganda (Katusiime, 2021).

This study is conducted on commercial banks in ASEAN region as one of the largest economic regions in the world. It addresses commercial banks in especially Indonesia and Malaysia since there are similarities on the banking sector in the two countries such as geographical location, economic, socio-political aspects, and banking political economy (Prasetyo, Pantas, Ashar, & Pertiwi, 2020; Samryn, 2022). Both countries develop dual banking system: conventional bank and sharia bank. Several studies has been conducted to
examine the effects of profitability on Indonesian and Malaysian banks, but most of them focused on Islamic banks (S. Karim et al., 2021; Rahmi & Sumirat, 2021). Research about profitability determinants on Indonesian and Malaysian conventional banks has not been done much, especially in the context of global economic crisis due to the Covid-19 pandemic.

This research aims to examine the effects of credit risk, liquidity risk, and bank capital on profitability of Indonesian and Malaysian banks during the Covid-19 pandemics using panel data regression model. This study contributes to the current literature since it is conducted based on nations to examine whether all variable independent bring the same effect on Indonesia and Malaysia.

**LITERATURE REVIEW**

**The Effects of Credit Risk on Bank Profitability**

Most income of banks are obtained from interest income and this makes credit risk become one of the most critical risks for banking sector. Credit risk arises when the borrower cannot pay his financial obligations according to the agreement (Andrianto, et al., 2019). Banks must apply the precautionary principle in lending to avoid non-performing loans (NPL). OJK Regulation No. 15/POJK.03/2017 defines non-performing loans (NPL) as loan that has bad quality with collectability of 3 (Poor), 4 (Doubtful) and 5 (Bad). This credit quality can be measured using NPL ratio.

Abnormal credit growth and economic crisis can increase loan loss provisions (LLPs) and NPL, thereby reduce bank profitability (Rossi et al., 2018). High unproductive loans also decrease the opportunity for banks to gain income from loans that ultimately reduce the bank profitability because some of the funds must be set aside as reserves for problem loans (Sari,
2022). Bank must maintain the NPL ratio below 5% of total credit otherwise the business continuity is considered in danger (OJK, 2017).

Pintor (2022) examined the impact of credit risk, bank capital, and bank liquidity on bank profitability with operational effectiveness as the moderating variable. The result shows that credit risks partially has a negative and significant effect on bank profitability. This findings was similar to the research of Abdelaziz et al., (2020) and Saleh dan Afifa (2020). Accordingly, the proposed hypotheses are as follow:

- **H₁**: Credit risk has a negative and significant impact on Indonesian banks profitability during Covid-19.
- **H₂**: Credit risk has a negative and significant impact on Malaysian banks profitability during Covid-19.

### The Effects of Liquidity Risk on Bank Profitability

OJK states that banks must maintain adequate liquidity in order to anticipate crisis (OJK, 2015). Adequate liquidity makes banks to remain solvent and able to cope with various economic situations, to channel fund to debtors via credit, and to reserve fund for customers withdrawals (Ali & Dhiman, 2017; Pramitasari, 2020). Very high ratio indicates unavailability of liquidity for banks to cowl any unanticipated fund requirements. On the opposite, very low ratio suggests the bank does not have enough income (Karim, et al., 2021).

Liquidity risk is one of the banks’ problems during the economic crisis and arises when bank experiences lack of liquid fund against the customers excessive withdrawals and this makes bank unable to cover short term obligations and unexpected cash outflow (Saleh and Afifa, 2020). As a result, capacity of the bank to channel fund via credit decreases and affect bank profitability negatively. According to the regulation of Bank Indonesia No. 12/12/PBI/2019, liquidity of banks must meet LDR ratio minimum 84% and maximum 94%. Some studies
concluded that liquidity risk has negative impact on bank profitability (Adelopo, et al., 2018; Khalid & Hossain, 2019; Abdelaziz, et al., 2020). Abdelaziz, et al. (2020) examining the interactional relationship of credit risk, liquidity risk, and bank profitability in MENA region concluded that there is negative relationship between liquidity risk and bank profitability. Thus, the hypotheses are proposed as follow:

\[ H_3 : \text{Liquidity risk has a negative and significant impact on Indonesian banks profitability during Covid-19.} \]

\[ H_4 : \text{Liquidity risk has a negative and significant impact on Malaysian banks profitability during Covid-19.} \]

The Effects of Bank Capital on Bank Profitability

Bank capital acts as risk protector and tools to improve bank performance and effectiveness (Mateev, et al., 2021). Higher bank capital will increase public’s trust on the bank (Abbas et al., 2019). Based on OJK regulation No. 11/POJK.03/2016, the requirement for minimum capital adequacy is 8-14% depending on the level of bank’s risk profile.

High capital will make the bank easier to offer services and to extend credit to the public and thus profitability increases. In addition, banks with higher capital are able to take higher risks as they can extend credit to potential debtors who may get benefit from their business operations (Laato, Islam, Farooq, & Dhir, 2020). Some studies found that bank capital has positive impact on bank profitability (Abbas, et al., 2019; Saleh & Afifa, 2020; Pintor, 2022). The hypotheses are thus proposed as follow:

\[ H_5 : \text{Bank capital has a positive and significant impact on Indonesian banks profitability during Covid-19.} \]

\[ H_6 : \text{Bank capital has a positive and significant impact on Malaysian banks profitability during Covid-19.} \]
METHODS

This research uses a quantitative approach and aims to analyze the impact of credit risk, liquidity risk, and bank capital on bank profitability using secondary data from financial statements published in the banks’ website. Population of this study are all conventional banks in Indonesia and Malaysia. The sample was determined using purposive sampling method that covers commercial banks that are still operating, listed on the stock exchange, not a sharia bank and digital bank, and publish financial report quarterly during 2020-2021 completely. The criteria resulted in 304 observation of Indonesian banks and 64 observations of Malaysian banks.

There are two regression models used in this study:

\[ \text{NIM}_{\text{Ind it}} = \alpha_0 + \beta_1 \text{NPL}_{\text{Ind it}} + \beta_2 \text{LDR}_{\text{Ind it}} + \beta_3 \text{CAR}_{\text{Ind it}} + \varepsilon_{\text{it}} \]  
\[ \text{NIM}_{\text{My it}} = \alpha_0 + \beta_1 \text{NPL}_{\text{My it}} + \beta_2 \text{LDR}_{\text{My it}} + \beta_3 \text{CAR}_{\text{My it}} + \varepsilon_{\text{it}} \]

where NIM denotes the dependent variable (bank profitability) at time, NPL represents credit risk i at time t, LDR represents liquidity risk i at time t, and CAR represents bank capital i at time t. Ind represents Indonesian banks and My represents Malaysian banks. \( \alpha \) is constant, \( \beta \) is coefficients and \( \varepsilon \) is error term. Table 1 shows the detail of the independent and dependent variables of this study.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Proxy</th>
<th>Measurement</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Dependent variable</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bank profitability</td>
<td>Net interest margin (NIM)</td>
<td>( \frac{\text{Net Interest Income}}{\text{Average assets}} \times 100% )</td>
</tr>
<tr>
<td><strong>Independent variable</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Credit risk</td>
<td>Non-performing loan (NPL)</td>
<td>( \frac{\text{Non-performing loans}}{\text{Total loans}} \times 100% )</td>
</tr>
<tr>
<td>Liquidity risk</td>
<td>Loan to deposit (LDR)</td>
<td>( \frac{\text{Total loans}}{\text{Total deposits}} \times 100% )</td>
</tr>
<tr>
<td>Bank Capital</td>
<td>Capital adequacy (CAR)</td>
<td>( \frac{\text{Tier 1 Capital} + \text{Tier 2 Capital}}{\text{Risk weighted assets}} \times 100% )</td>
</tr>
</tbody>
</table>
The analysis will be conducted with panel regression method using E-Views 9. Standard estimation techniques for panel data using Chow test and Hausman test was used and the results indicated that random effect model is accepted to be used in the models for both Indonesian banks and Malaysian banks. The alpha (\( \alpha \)) was 5\% or 0.05.

As the normality test shows that the residual value of Indonesian banks model is not normally distributed, the outlier was excluded and the final sample of Indonesian banks become 232 observations.

**RESULTS AND DISCUSSION**

**Results**

Table 2 shows the descriptive statistics of the variables. The full data including the outliers was used for analyzing descriptive statistics to shows the condition of each variable in each country within the observation time.

<table>
<thead>
<tr>
<th>NIM_IND</th>
<th>NIM_MY</th>
<th>NPL_IND</th>
<th>NPL_MY</th>
<th>LDR_IND</th>
<th>LDR_MY</th>
<th>CAR_IND</th>
<th>CAR_MY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>3.89</td>
<td>2.13</td>
<td>3.92</td>
<td>1.89</td>
<td>84.41</td>
<td>90.58</td>
<td>26.77</td>
</tr>
<tr>
<td>Max</td>
<td>7.77</td>
<td>2.66</td>
<td>22.27</td>
<td>3.60</td>
<td>241.97</td>
<td>101.30</td>
<td>201.57</td>
</tr>
<tr>
<td>Min</td>
<td>-0.95</td>
<td>1.44</td>
<td>0.08</td>
<td>0.26</td>
<td>29.67</td>
<td>83.50</td>
<td>8.02</td>
</tr>
<tr>
<td>Std Dev.</td>
<td>1.68</td>
<td>0.24</td>
<td>2.97</td>
<td>1.05</td>
<td>30.07</td>
<td>4.09</td>
<td>17.24</td>
</tr>
</tbody>
</table>

During the observation period, Indonesian banks were able to produce higher profitability than Malaysian banks as indicated by higher average NIM of Indonesian banks (3.89) than that of Malaysian banks (2.13). However, the profitability of Malaysian banks is more stable than Indonesian banks as indicated by low standard deviation of Malaysian banks (0.24). In addition, all Malaysian banks were able to make profits during the observation period, while some Indonesian banks had negative NIM. The average credit risk of Indonesian
and Malaysian banks was still within the standard range of 5 set by OJK. Even it appears that there were numbers of Indonesian banks that have NPLs exceeding the standard set by the OJK, while all the Malaysian banks still can maintain the NPLs below 5. This shows that Malaysian banks have the ability to maintain the NPLs fluctuation during the economic crisis due to Covid-19.

The liquidity risk of Indonesian banks is lower than Malaysian banks as indicated by lower average LDR ratio but still quite in line with 84-94 standard set by Bank Indonesia. Nevertheless, there are several banks that were not able to maintain the LDR ratio according to the health standards set by Bank Indonesia. It is apparent that the LDR ratio of Indonesian and Malaysian banks has minimum LDR value that is < 84 and maximum value that is > 94. This indicates that the global economic shock in the form of the Covid-19 pandemic has caused some banks unable to maintain their adequacy liquidity. Indonesian banks had better bank capital than Malaysians that is indicated by higher average CAR. The CAR of Indonesian and Malaysian banks are however still in line with the standard of Bank Indonesia.

**Panel Regression – Random Effect**

Table 3 presents the results of panel regression on both research models. The coefficients of credit risk of Indonesian banks (NPL_IND) is negative with the p-value of 0.03 that is less than the alpha (α). Thus, H1 is accepted meaning that credit risk has partially a negative and significant effect on profitability of the Indonesian banks. Meanwhile, the coefficient of credit risk of Malaysian banks (NPL_MY) is negative with the p-value 0.56 that is higher than the alpha (α) and thus H2 is rejected indicating that partially credit risk has no effect on profitability of the Malaysian banks.
Table 3. The Results of Regression on Indonesian and Malaysian Banks

<table>
<thead>
<tr>
<th>Variables</th>
<th>Expected Signs</th>
<th>Coefficients</th>
<th>t-stat</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Indonesian Banks</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NPL_IND</td>
<td>-</td>
<td>-0.04</td>
<td>-2.25</td>
<td>0.03</td>
</tr>
<tr>
<td>LDR_IND</td>
<td>-</td>
<td>0.01</td>
<td>6.36</td>
<td>0.00</td>
</tr>
<tr>
<td>CAR_IND</td>
<td>+</td>
<td>-0.00</td>
<td>-1.81</td>
<td>0.07</td>
</tr>
<tr>
<td><strong>Malaysian Banks</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NPL_MY</td>
<td>-</td>
<td>-0.04</td>
<td>-0.59</td>
<td>0.56</td>
</tr>
<tr>
<td>LDR_MY</td>
<td>-</td>
<td>0.00</td>
<td>0.48</td>
<td>0.63</td>
</tr>
<tr>
<td>CAR_MY</td>
<td>+</td>
<td>-0.02</td>
<td>-0.97</td>
<td>0.34</td>
</tr>
</tbody>
</table>

1 Dependent Variable : NIM_IND  
2 Dependent Variable : NIM_MY

The coefficients of liquidity risk of Indonesian banks (LDR_IND) is positive with the p-value of 0.00. H3 is thus rejected indicating that partially liquidity risk has a positive and significant effect on profitability of Indonesian banks. Similarly, the coefficients of liquidity risk of Malaysian banks (LDR_MY) is positive with the p-value of 0.63. Thus, H4 is rejected which means that partially liquidity risk does not affect profitability of Malaysian banks.

The coefficients of bank capital of Indonesian banks (CAR_IND) is negative and the p-value of 0.07. This results H5 is rejected which means that partially bank capital does not affect profitability of Indonesian banks. Similar result is attained for the case of Malaysian banks. With the coefficients of bank capital of Malaysian banks (CAR_MY) is negative and the p-value of 0.34, H6 is rejected meaning that partially bank capital does not affect profitability of Malaysian banks.

**Discussion**

The results of panel regression shows that credit risk has a negative relationship with bank profitability and this is similar with the results of the research conducted by Adelopo, et al. (2018), Khalid & Hossain (2019); Abdelaziz, et al., (2022). This findings are also in line with the opinions of Rossi et al. (2018) and Sari (2022) stating that economic crisis can increase LLPs and NPLs which then decrease fund of the banks channeled into that possibly
makes profitability to decline. Cross country analysis on Indonesian and Malaysian banks shows that credit risk affects negatively and significantly only on Indonesian banks. This result shows that Malaysian banks can compile a good credit portfolio so they can maintain stable NPLs during the Covid-19 pandemic as indicated by low standard deviation of NPLs. According to Samryn (2022), there are differences in the characteristics of Indonesian and Malaysian banks in which Indonesian banks rely more on domestic operations that make them are very vulnerable to domestic macroeconomic shocks. Meanwhile, Malaysian banks are focused more on expanding foreign investment to take advantage of global economic stability so that a shock in one country has no impact on their performance.

The results of panel regression show that liquidity risk has a positive relationship with bank profitability. This finding is different from the research conducted by Adelopo, et al. (2018), Khalid & Hossain (2019), Abdelaziz, et al., (2020), but is aligned with the results of Abbas et al (2019), Pintor (2022), Saleh & Afifa (2020). The Covid-19 pandemic prompted the government to provide stimulus policies to support the banking sector by for example providing a stimulus to reduce the interest rates (Susilawati, et al., 2020; Xin, 2020). This lower rate can be utilized by banks that have a good level of liquidity to increase their volume of lending to those who are considerably capable in fulfilling their obligations. In turn, banks may experience increase in their interest income that then lead to higher profitability. Cross country analysis on Indonesian and Malaysian banks shows that liquidity risk affects positively and significantly only on Indonesian banks. Banks with liquidity risk that is close to the upper limit set by the central bank are likely to maintain their level of liquidity for them to be able to meet short-term obligations and avoid penalties from the central bank (Sayadi & Sari, 2021).
The results of panel regression show that bank capital does not affect bank profitability on both Indonesian banks and Malaysian banks. This finding is different from the result of the research conducted by Abbas, et al. (2019), Saleh and Afifa (2020), Pintor (2022), but is aligned with the results of Pinasti and Mustikawati (2018) and Madugu et al. (2020). Laeven and Valencia (2021) defined an economic crisis as a phenomenon that causes chaos and great losses to the banking system. The Covid-19 pandemic has been experienced by all Indonesian and Malaysian banks with both large and small capital and thus the amount of bank capital cannot boost bank profitability.

CONCLUSIONS AND IMPLICATIONS

Conclusion

The results of this study indicate that during the Covid-19 pandemic, credit risk has a negative impact on bank profitability, liquidity risk has a positive impact on bank profitability, while bank capital does not have impact on bank profitability. Banks with good credit portfolio that can maintain stable NPLs in every economic situation will be able to generate a good profitability. Banks also need to maintain their level of liquidity risk because high ratio indicates unavailability of liquidity to cover any unanticipated fund requirements. On the opposite, low ratio suggests that the bank does not have enough income (Karim, et al., 2021). The interesting finding of this study is that bank capital does not have effect on bank profitability and the effect of each variable on Indonesian and Malaysian banks were different although Indonesia and Malaysia have similarity in geographic location, economics, socio-politics, and banking system.
Implications

This study was conducted in the context of the Covid-19 pandemic and thus the study experience lack of yearly observation data since the Covid-19 pandemic emerged since 2020. The statistics data of this study was thus taken from quarterly reports of the banks in 2020-2021 that imply that secondary information can be the alternative.

Future research may examine the effect of the Covid-19 pandemic further by the timeline before, during and after the pandemic and explore the determinants of Malaysian banks profitability.

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