Inflation And Islamic Banks Financing For Smes ; A Dynamic Panel Approach

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Abstract—As a part of the financial system, Islamic banks also have exposure to macroeconomic variables such as inflation during financial turmoil. Therefore, this study aims to examine the impact of inflation on Islamic banks' credit risk for Small Medium Enterprises (SMEs) before and during the Covid-19 outbreak. Adopting the panel dynamic approach, the study used panel data from all 33 provinces from January-2016 to November-2020 which is equal to the 1947-observation period. the findings reveal that inflation has a significant effect on Islamic banks' credit risk for SMEs. In detail, during the Covid-19 pandemic, SMEs financing has a positive and significant to inflation rate but it is different from before the Covid-19 pandemic while the lower level of inflation will increase the level of bad loans of Islamic banks particularly in capital financing. Moreover, from the VDs and IRFs results, the effect of inflation on Islamic banks NPF is much higher and fluctuated compared to other periods in which it can be a signal that the Covid-19 pandemic impacts Islamic banks financing to SMEs.

Keywords—Islamic bank, credit risk, the Covid-19 pandemic, inflation, SMEs.

Abstrak—Sebagai bagian dari sistem keuangan, bank syariah juga memiliki risiko terhadap variabel makroekonomi seperti inflasi. Oleh karena itu, penelitian ini bertujuan untuk mengkaji dampak inflasi terhadap risiko kredit bank syariah bagi Usaha Kecil Menengah (UKM) sebelum dan selama pandemi Covid-19. Dengan menggunakan pendekatan panel dinamis, penelitian ini menggunakan data panel dari 33 provinsi pada periode Januari-2016 hingga November-2020 yang setara dengan 1947 observasi. Temuan penelitian ini mengungkapkan bahwa inflasi memiliki pengaruh yang signifikan terhadap risiko kredit bank syariah untuk UKM. Secara rinci, selama masa pandemi Covid-19, pembiayaan UKM memiliki pengaruh positif dan signifikan terhadap tingkat inflasi. Hal tersebut berbeda dengan sebelum pandemi Covid-19 dimana tingkat inflasi yang lebih rendah akan meningkatkan tingkat kredit macet bank syariah khususnya di bidang permodalan. pembiayaan. Apalagi dari hasil VDs dan IRFs, pengaruh inflasi terhadap NPF bank syariah jauh lebih tinggi dan fluktuatif dibandingkan periode lain yang bisa menjadi sinyal bahwa pandemi Covid-19 berdampak pada pembiayaan bank syariah ke UKM.

Kata kunci—Bank syariah, risiko kredit, pandemi Covid-19, inflasi, UKM.

INTRODUCTION

Small Medium Enterprises (SMEs) become one of the backbones for Indonesian economics. It can be seen from the data in which 60% of Indonesian Gross Domestic Products are from SME (Asia Pacific Foundation of Canada, 2018). Moreover, Huda (2012) stated that SMEs play important role in economic development because of several reasons. First, SMEs mainly operates in rural area and then it encourages local economy to grow. In addition, SMEs opens the job to the society to work with and SMEs also create more opportunity for the people to develop their entrepreneurial skill with opening small-scale business.

To support the development of SMEs, Matarneh and Manaseer (2020) explained that financing from Islamic banks is needed as a source of capital to ascertain the business sustainability of SMEs. In Indonesia, according to Indonesian Financial Service Authority (2021), the value of financing activity given by the banks tends to increase time by time between period 2016 (IDR 49,119 billion in January) and 2020 (IDR 69,136 billion in November). The financing for providing capital was roughly two times

higher than the financing for investment purposes. However, it is also shown that in June 2020, the amount of financing for both purposes had decreased.

A fall of financing for SME was predicted because of the effect of Covid-19 pandemic since Indonesian announced the its first case on March 2nd, 2020, then economic activities in Indonesia started to slump to have negative growth- the growth was -5.32% and -3.49% respectively in the 2nd and 3rd quarters. In addition, inflation was also decreased after the first case announcement that the trend moved from 2.96% in March 2020 to be 1.29% in November 2020. The value of inflation rate that was below 2% was started from June 2020 (Indonesian Statistics, 2020). According to this condition, Sukharev (2020) explained that Covid-19 pandemic created destabilization of economic circumstances.

The economic downturn in Indonesia occurs not only in the real sectors but also in the financial sectors. For the real sectors, financial distress due to Covid-19 pandemic causes many business sectors including SMEs have to close their operation because of the weakening of society purchasing power and it also impact to the income of the company. In financial industry, banks is considered to be the intermediary institution that suffers the most from current condition because the banks face uncertainty as well as expose to higher risk (Demirguc-kunt & Ruiz-ortega, 2020). Hence, as intermediary institution, the bank has to be careful to perform financing activities for deficit sides because of credit risk exposure becomes higher during financial turmoil.

Among the first research measuring the performance of the bank before and during covid-19 pandemic was conducted by Demirguc-kunt and Ruiz-ortega (2020) who studied about the impact of covid-19 to banking performance. The finding reveled that banks were underperformance particularly for the big-size bank. Mersha and Worku (2020) also had the similar finding as mentioned by Demirguc-kunt and Ruiz-ortega (2020). In case of Islamic banks, Elnahass, Trinh and Li (2021) found that Islamic bank suffered from covid-19 pandemic that can be seen from lower financial performance as well as facing higher asset risk. The finding is similar to Sutrisno, Panuntun and Adristi (2020) who also highlighted the negative impact of covid-19 pandemic to Islamic banks performance in Indonesia.

According to the current studies, the research about the impact of covid-19 pandemic to Islamic bank industry still needs to be developed because of lack of data and deep analysis. Hence, this study aims to complete the previous literature and give the new perspective about how covid-19 pandemic, with mainly concern to the impact of macroeconomic variables movement, affects the quality of Islamic banks' financing for SMEs in Indonesia. The structure of this study, after introduction, is firstly begun to explain the literature review. Secondly, result and explanation will be discussed and it is ended with conclusion.

LITERATURE REVIEW

The research concerning how covid-19 affect Islamic banks' financing to SMEs is not listed in high indexing international journals yet. Some of the few researches that discussed about the Islamic banks is conducted by Elnahass, Trinh and Li (2021) who examined the impact of covid-19 to global banking industry including Islamic banks. With assessing the financial performance (risk, accounting and market financial performance), they concluded that Islamic banks had lower performance and higher risk exposure during Covid-19 pandemic. In line with that, Sutrisno, Panuntun and Adristi (2020) observed the condition of Islamic banks performance in Indonesia. They claimed that due to a decrease of financing activity to the deficit side during outbreak, Islamic banks suffered financial losses.

Relating to the impact of inflations to the quality of Islamic banks financing, in general Islamic banks have many financing schemes based on the objective of the use of money such as for trading, investment and consumption activities. Matarneh and Manaseer (2020) stated that Islamic banks evidently increase their awareness to finance SMEs through Islamic financial schemes. As an indirect effect, it also contributes to help many people to work. However, the determinant of financing activities performed by Islamic banks such as macroeconomic variables are also important to be examined in order to understand its impact to the banks performance.

To assess the performance, Wiseman & Catanach (1997) suggest that credit risk can be used as the benchmark to examine the quality of banks' financing. Credit risk explains how the banks manage potential failure of debtor to return the money. In the context of the quality of Islamic banks financing activity, Alsyahrin et al. (2018) stated that credit risk, the term used in Islamic is non-performing financing (NPF), can be utilized as an indicator to determine the financial health of the banks.

According to the previous studies, credit risk was influenced by macroeconomic conditions including inflation rate (Iriani & Yuliadi, 2015; Ibrahim & Rahmati, 2017). In Indonesian perspective, Lin et al. (2016) revealed that credit risk is vulnerable to the inflation. In addition, the impact of inflation was evidently different from for each Islamic banks, having no significant relationship, and conventional banks, having negative and significant relationship.

Aviliani *et al.* (2015) that inflation has negative and relationship to the performance of banks' credit risk. The same finding was also possessed by Nursechafia and Abduh (2014), Erdinç and Gurov (2016) and Firmansyah and Gunardi (2018) that an increase in inflation rate can lower the rate of NPL. It can happen because the deficit party who got financing from the bank return the money with lower real value due to an increase of inflation. It benefits the deficit party because actual value of payment to the banks is less. The same results were also the same as Fofack (2005) and Warue (2013).

Klein (2013) and Abid et al. (2014) had different findings in which inflation evidently had positive and significant relationship to banks' credit risk. They added that a higher inflation was not in favor for the society because it reduced purchasing power. As a result, the society had lesser ability to return the money to the banks. The finding is the same as Jara-Bertin, Arias Moya and Rodríguez Perales (2014) stated that inflation affect the performance of the banks because an increase of price level means additional cost for the bank in managing the all risks faced by the banks. Then an increase of inflation means that the banks tend to riskier due to facing a higher uncertainty in the market (Zulkhibri & Rizky, 2017).

From the previous research it can be seen that the impact of inflation to the banks' bad loan varies depending on economic condition. Aviliani *et al.*, (2015) argued that the impact of inflation to the banks performance will depend on the anticipation of the banks. When the banks are able to adjust to an increase or a decrease of inflation, the bank can generate more profit than its cost. However, it can occur inversely it the banks fail to anticipate the shock due to a dynamic movement of inflation during financial turmoil (Aviliani et al., 2015).

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RESEARCH METHOD

In this paper, the data is obtained from Indonesian financial services authority and Indonesian statistics. Totally the data has 1947-obervarion period retrieved from January 2016 to November 2020 in monthly based from 33provinces Indonesia. In addition, this study adopts panel data which means that cross-section and time series data is gathered to measure the influence of regional macroeconomic factors, which the proxy is regional inflation to total non-performing financing of Islamic bank. From that objection, the following equation is as follow;

$$NPF_{it} = \beta_0 + \beta_1 INF_{it} + \beta_2 LN\_FIN_{it} + \beta_3 FDR_{it} + \beta_4 LN\_ASST_{it} + \varepsilon_{it}$$

NPF, as dependent variable, stands for Non-Performing Financing which is described as the percentage of non-performing financing divided by total financing. The higher (lower) percentage express bad (good) performance of Islamic bank in performing financing activities. In this study, NPF is divided in to two which are non-performing financing in capital financing for SMEs (N_CSME) and non-performing financing in investment financing for SMEs (N_ISME).

INF is defined as the percentage of regional consumer index price in each province while LN_FIN is log of total financing in Indonesian dollar rupiah of Islamic banks. Moreover, FDR is the percentage of total financing divided by funding received by Islamic banks from the third parties and LN_ASST is defined as log of total asset of Islamic banks in Indonesian dollar rupiah.

β0 expresses the constant term of the equation then from β1 to β4 are estimated parameters in the model. Moreover, *I* is cross-section data, showing the Islamic bank in each province level, and *t* explains about time series data and εit is an error term in this model.

To estimate the model, we use panel dynamic approach to analyze the relationship between regional macroeconomic factor to Islamic banks' bad loan for SMEs financing. The reasons to use dynamic panel data are;

1. Providing time-series effect inside panel data form to measure short and long-run impact (Holtz-Eakin, Newey and Rosen, 1988)
2. Providing an opportunity for the researcher who have extensive data (Perron, 1991) and allowing interdependence relationship from cross-section data with different individual effect (Pedroni, 2000 ; 2004)

In addition, to reach research objective, Panel Vector Autoregressive (PVAR) is used as a analytical tools in dynamic panel data as suggested by Holtz-Eakin, Newey and Rosen (1988). Moreover, Anarfo *et al.*, (2019) and Fakhrunnas (2020) stated that PVAR fix the issue of endogeneity problem for unobserved individual heterogeneity and the variables in panel data which is permitted to exist. The specific models in this study are;

Model 1

$$N\_CSME_{it} = \sum_{j=1}^{p} \emptyset_{1j} N\_CSME_{it-j} + \sum_{j=1}^{p} \emptyset_{2j} INF_{it-j} + \sum_{j=1}^{p} \emptyset_{3j} FDR_{it-j} + \sum_{j=1}^{p} \emptyset_{4j} LN\_FIN_{it-j} + \sum_{j=1}^{p} \emptyset_{5j} LN\_ASST_{it-j} + f_i + d_t + e_{it} \quad (2)$$

Model 2

$$N\_ISME_{it} = \sum_{j=1}^{p} \emptyset_{1j} N\_ISME_{it-j} + \sum_{j=1}^{p} \emptyset_{2j} INF_{it-j} + \sum_{j=1}^{p} \emptyset_{3j} FDR_{it-j} + \sum_{j=1}^{p} \emptyset_{4j} LN\_FIN_{it-j} + \sum_{j=1}^{p} \emptyset_{5j} LN\_ASST_{it-j} + f_i + d_t + e_{it} \quad (3)$$

As the beginning, unit roots test is applied to measure the level of stationary. If the level of stationary is in-level, then PVAR test can be conducted. In the end, Variance Decompositions (VDs) and Impulse Response Factors (IRFs) are adopted. Both last tests have the functions to measure multivariate causalities among observed variables and depict the time-change variation of the influence of each variable to other variables (Rosylin & Bahlous, 2013).

RESULT AND DISCUSSION

The description of the data is explained in the Appendix 1 which reflects the value of observed variables. For non-performing loan for capital financing in SMEs (N_CSME), the highest value is 8.058% and 0% is the minimum percentage of NPL. Lower than that, non-performing loan for investment financing in SMEs (N_ISME) is 5.828% as the highest number of bad loan while averagely the bad loan rate is 0.141% in all provinces during observation period. In addition, the highest monthly inflation rate was 4.2% that occurred in D.I Yogyakarta Province on December 2017. In terms of financing activities, Islamic banks in West Sumatra Province became the most aggressive banks that financed deficit sides (FDR) reaching 256.6% on June 2020. Moreover, averagely in all provinces in Indonesia, the percentage of total financing to funding from third party in Islamic banks is 111.8%.

For how much money was given for financing activities (FIN), the average amount of money is IDR 8,900.467 bn during the observation period in all provinces. The highest value of FIN is IDR 158,743.1 bn happened in D.I Yogyakarta Province on May 2020 while the lowest was in West Sulawesi Province on April 2017. Moreover, the biggest asset of Islamic banks during observation period is located in D.I Yogyakarta on November 2020.

Regarding to unit roots test result, it is showed in Appendix 2. Based on Augmented Dickey Fuller (ADF) and Philip-Perron (PP) in intercept, trend and intercept, and none approach, it can be seen that all variable are stationary in level. The level of stationary varies between 1% to 10% even though in almost all approaches used in unit roots tests. This results imply that Panel Vector Autoregressive (PVAR) is proper method to be used as proposed by Pesaran (2012) and Pedroni (2000, 2004).

According to Appendix 3 explaining Panel VAR Results, the study is grouped in to three condition: All periods, before Covid-19 period and during Covid-19 period. In all groups, the models are statistically significant that is reflected from F-statistic value which are significant in 1% level. In addition, the value of Adjusted R-squared explains that independent variables explain between 68% and 98% of dependent variables and the number of percentage varies in each model.

In all periods, in the third lag, inflation has negative and significant relationship to bad loan in capital financing for SMEs. According to the finding, a decrease in inflation will increase the percentage of bad loan which means that SMEs tend to be unable to return the money when inflation rate is lower.

This finding is in line with Nursechafia and Abduh (2014), Erdinç and Gurov (2016) and Firmansyah and Gunardi (2018). As explained by Aviliani *et al* (2015), in certain level, a lower inflation rate reflects a lower purchasing power from the society during economic turmoil and it directly affects SMEs' revenue due to a decrease in the level of absorption of goods and services produced by SMEs. However, in the second lag, the impact of inflation is positive and significant to bad loan. The finding explains that Islamic banks attempt to do risk-adjustment process to the impact of inflation during that period.

Moreover, for non-performance financing in investing activities for SMEs, inflation rate in third lag influences the bad loan with negative and significant. The finding is contrast to Klein (2013) and Abid et al. (2014) which in their studies found different direction of significant relationship. As mentioned by Sukharev (2020), from the customer side, when inflation rates falls, the demand for goods and services is lower because the society is unable to purchase it. From Islamic banks perspective, this finding confirms that Islamic bank still have an exposure to macroeconomic variables particularly from inflation with may endanger bank performance if it fails to be well-managed.

To measure the impact of Covid-19 pandemic to Islamic banks' bad loan in SMEs' financing, this study is separated in to different times: before and during Covid-19 pandemic in Indonesia. According to Appendix 4., it can be seen that before Covid-19 pandemic, inflation influences negative and significant to bad loan in capital and investment financing for SMEs in the third lag. This relationship indicates that, before Covid-19 pandemic occur, a higher inflation will benefit Islamic banks to have a better performance in financing activities in which this finding is similar to Jara-Bertin, Arias Moya and Rodríguez Perales (2014). The finding possibly occurs because a higher inflation, until certain percentage, is possibly driven by a higher demand from the society to purchase goods and services in the market in which SMEs benefit from that circumstances. Moreover, risk-adjustment process performed by Islamic banks is seen from the impact of inflation that become positive and significant to the bad loan in the first lag for investing financing. The risk-adjustment portrays that the banks attempts to manage the movement of macroeconomic variables to generate more profit over the cost (Aviliani et al., 2015).

During covid-19 pandemic, inflation rate has positive and significant relationship to bad loan in capital financing for SMEs. It appoints that during Covid-19 pandemic, a lower rate in inflation increase the ability of SMEs to share the profit or return the money to Islamic banks. This result is supported by previous studies conducted by Klein (2013) and Abid et al. (2014). It also possibly emphasizes that, in Islamic banks' financing during Covid-19 pandemic, lower percentage of inflation possibly benefits for SMEs as the lenders to have higher level of real return as long as the business process is stable and does not experience significant loss during the outbreak. This finding is different from all period and before Covid-19 pandemic for the same financing sectors.

Moreover, during Covid-19 pandemic, inflation rate also has positive and significant effect to bad loan in investment financing for SMEs in the first lag even though it is negative and significant in the fourth and third lag. The risk-adjustment process is possibly performed by Islamic banks as an attempt to manage risk exposure to macroeconomic variables (Aviliani et al., 2015). In addition, SMEs financed by Islamic bank for investment financing objective tend to have higher ability to return the money when inflation is low. Hence, during Covid-19 pandemic in which inflation rate in Indonesia is lower, it benefits Islamic banks because of having better performance in financing activities. On the other hands, SMEs financed by Islamic banks possibly have good performance because they can return the money to Islamic banks amid real and financial sector turmoil during Covid-19 pandemic in Indonesia.

The result of Variance Decompositions (VDs) can be seen from Appendix 4 which compares the influence of inflation based on the period of observations. In general, during Covid-19 pandemic inflation has highest influence to bad loan in capital financing for SMEs. It is showed that during pandemic, inflation affect almost 2% to the value of N_CSME compared while the value of inflation in all period and before Covid-19 only contributes less than 0.3% to the value of bad loan. In the bad loan in investment financing for SMEs, the trend is almost same. During Covid-19 pandemic, inflation can contribute more than 4% to the value of N_ISME while, in all period and before Covid-19 pandemic,

inflation only contributes less than 0.4%. The results of VDs depict that the impact of inflation to the Islamic banks' bad loan is higher during covid-19 pandemic than other periods.

Lastly, to examine the time-variant movement of the influence of inflation to Islamic banks' bad loan is described by the result of Impulse Response Factors (IRFs) in the Appendix 5. In all period, the response of both bad loan: N_CSME and N_ISME are almost the same that is stable to move slightly around zero line. Moreover, before Covid-19 pandemic, the trend of N_CSME and N_ISME are also similar. Having uptrend above zero line around the first-three period, it then moves downward below zero line over the rest period of observation. During the period of Covid-19 pandemic, the response of Islamic banks' bad loan to inflation is more fluctuated. For N_CSME, a positive trend which is above zero line is started to occur after the first-two period observation and it consistently increases until the end of the period. In contrast, in the first-two period, N_ISME has an increase movement above zero line but a downward movement begins after about fourth period. After that, the response of N_ISME to inflation is consistently below zero line. From the result of IRFs, it explains that there is a difference of Islamic banks' bad loan in response to inflation exists in each period of time particularly during Covid-19 pandemic that is much more fluctuated than other periods.

CONCLUSION

Small Medium Enterprises (SMEs) has an important role to support economic development in Indonesia. SMEs evidently succeed to employ many people to work due to having productive activities to produce goods and services. In addition, Islamic banks have a vital role to provide financing scheme either in capital or investment financing for SMEs. According to the findings, this study reveals that it has significant relationships between inflation and Islamic banks' financing performance to SMEs. During Covid-19 pandemic, SMEs financing has positive and significant to inflation rate which means that SMEs are able to return the money if inflation rate is lower. This finding is different from before covid-19 pandemic while lower level of inflation will increase the level of bad loan of Islamic banks particularly in capital financing. From the Islamic banks perspective, risk-adjustment process is possibly performed by Islamic bank to tackle the risk exposure to inflation in before and during Covid-19 pandemic especially in investment financing. Moreover, from the VDs and IRFs results, the effect of inflation to Islamic banks NPL is much higher and fluctuated compared to other periods. It can be a signal that Covid-19 pandemic impacts Islamic banks financing to SMEs.

According to the findings, this study suggests to all financial stakeholders to be aware from the financial turmoil due to Covid-19 pandemic. Islamic banks and the financial authority must take more attention to the risk exposure in financing activities. So that, financial authority such as central banks may give more relaxation for banking industry to deal with uncertainty during outbreak. Finally, to capture more comprehensive phenomena in Islamic banks industry, a wider range of samples across countries is needed to be used. It is important because by using a wide-range sample, the impact of covid-19 pandemic in Islamic bank industry can be well informed with considering cross sectional effect as well as time-series effect.

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