

SMEs' CREDIT DEMAND AND ECONOMIC GROWTH IN INDONESIA

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Abstract

This study aims at empirically exploring the short- and long-run relationships between economic growth, non-performing loans, interest rates and the credit demand by the small and medium enterprises (SMEs) in Aceh province, Indonesia. The quarterly data for the period 1995 to 2015 were analyzed by the cointegration and vector error correction model (VECM). The study documented that there was a cointegration among the economic growth, non-performing loans, interest rates and the credit demand, implying the existence of long-run equilibrium among the variables. In addition, in short-run, the study found a unidirectional causality from economic growth to credit demand, a bidirectional causality between interest rates and credit demand, while no causality existed between non-performance loan and credit demand by the SMEs in Aceh, Indonesia. Thus, to enhance the SMEs, the government should focus on promoting the economic growth by managing the stability of interest rates in the province.

Keywords: Credit demand, Economic growth, Non-performing loan, SMEs.

JEL classification: C22, E59, O49, H81

1. Introduction

Various economic policies aimed at resolving the economic problems such as uplift poverty, reduce the unemployment rate, minimize the unequal distribution of income, and in turns, promote economic growth. One of the government's efforts to combat poverty and reduce unemployment in Indonesia is through the acceleration of the real sector and the empowerment of small and medium enterprises (SMEs), as stated in the Presidential Instruction No. 6 of 2007. The main objective of this policy is to promote the SMEs and enhance its contribution to the economic development.

The role of SMEs in improving the welfare of the community can be seen in their involvements in the economy and development. According to the thesis of flexible specialization (Piore and Sabel, 1984), the presence of the SMEs has been increasingly important to the development of the national economy. The thesis stated that the SMEs grow fast and even faster than the large enterprises in the ongoing development process. The emergence of this thesis has rejected the classical theory, which was introduced by Hoselitz (1959) and Anderson (1982) on the role of SMEs in the economy. The classical theory stated that the role of the SMEs in the economy has been getting smaller as it had been taken over by the large businesses. From a macroeconomic perspective, the contribution of SMEs to the national economic development could, at least, be in three following ways. Firstly, their involvements in the formation of income per capita. Secondly, their involvements in the gross domestic product (GDP) formation. Finally, their involvements in the formation of regional

economic growth (Kusnandar, 2012). This further implies that the SMEs play a pivotal role in eradicating the poverty by promoting the welfare of the society.

In Indonesia, the SMEs continues to show their significant roles in enhancing the level of economic activity in almost all economic sectors, except for the oil and natural gas sector, which was handled by the large-scale companies. The SMEs have been showing a positive growth in the last few decades, while the role of large-scale enterprises in the Indonesian economy has been declining (Aceh in Figures, 2011). Due to their contribution to the national economy, the presence of the SMEs has been very much supported by the government, hoping to further continue their contribution to reducing the poverty rate in the country. In 2015, the poverty rate in Indonesia was 11.2% or equivalent to 28.5 million people was living under the poverty line.

As one of 34-province in Indonesia, although Aceh has experienced positive economic growth by 6.06% annually after the political conflict (1989 - 2004) and tsunami (2004) hit hardly the province, many poor people have been living in Aceh (Aceh in Figures, 2015). The poverty rate of the province has been relatively higher than its national level. According to the Central Statistics Agency (BPS) of Aceh (2016), there was 20.98% of Aceh's population were living under the poverty line in 2010, 19.57% in 2011, 19.468% in 2012, 17.60% in 2013, 18.05% in 2014, and 17.11% in 2015.

Recognizing the important role of the SMEs in alleviating poverty, the provincial government of Aceh has supported their presence and continuation to further contribute to improving the provincial economy. The SMEs could offer opportunities for new jobs, boost investment and enhance exports. This is in line with the statement by Holcombe (1998) that the SMEs have been the engine of economic growth. However, in reality, it has been not an easy task to manage the SMEs sustainably, thus positively and continuously contributing to the economic growth. The SMEs have been facing a variety of problems and obstacles both internally and externally. The internal problems faced by the SMEs including mismanagement, lack of human resource capacity, lack of mastery of technology, lack of capital accessibility, non-performing loan, and marketing of a product. Meanwhile, the external problem faced by the SMEs including the economic slowdown, higher level of interest rates, inflation, tax rate, and so on.

Of the above-mentioned problems, lack of capital has been recognized as one of the dominant problem faced by the SMEs in Indonesia (Bank Indonesia Survey 2009). The SME always seeks the financial supports from the financial institutions, particularly banks. A total of 49.3% of the SMEs in Indonesia has demanded additional capital to increase their capacity. In this context, as the intermediary institutions, banks should grant sufficient micro-credit to support the SMES, and in turns, need to promote the national economic growth. In Indonesia, the bank is the most dominant financial system in the country. At least, about 77% of the total financing for the real sector comes from the banking industry. The important role of banking institutions has been recognized since 1933 by Fisher (1933). Stiglitz and Greenwald (2003) and Khemraj and Pasha (2009) stated that the bank was the most superior intermediary institutions, especially in handling asymmetric information and resolving transaction cost of credit. If we look at the figures of loans provided by the banks to the SMEs, it showed an increasing trend in Indonesia, including Aceh (Bank of Indonesia 2013). However, the loans provided by the banks to the SMEs have been still far from expected.

According to Agénor et al. (2004), the number of loans provided by the banking institution to the SMEs was dependent on the factors of demand- and supply-side. Harmanta and Ekananda (2005) documented that after a period of twin national banking crises during the 1997-2000 periods (Kasri, 2011), there was an excess supply of loans due to weak demand for credit. According to Soekarni et al. (2009), this was partly due to the slowing progress of businesses that was characterized by a decrease in their turnover, the constraints of banking access, and the expectations of the business community to changes in the credit priority given by the banks to selected economic sectors.

There have been many factors affecting the demand for banks' credit, for example, non-performing loan (NPL), interest rate, and level of economic activity. In their study on the US economy, Berrospide and Edge (2010) found that economic growth significantly affected the provision of credit. Additionally, Das and Ghosh (2007) documented that the emergence of credit risk has associated with macroeconomic changes, such as price instability, interest

rates, and growth of the economy (Bonfim, 2009; Figlewski et al., 2012). The increase in economic growth, which is measured by the increase in the value of all goods and services produced indicate the increase in income level that, in turns, significantly affected the ability of borrowers to repay their loans (Thiagajaran et al., 2011). Therefore, the improvement in economic performance that is characterized by an increase in GDP would increase the level of demand for credit by the SMEs (Simaremare and Hidayat, 2013).

Apart from the level of economic activity, the stability of monetary policy also provides a conducive environment for the banking institutions to expand their credit and portfolios (Indarti and Langenberg, 2004). With an affordable interest rate policy would lead the SMEs to absorb a higher level of credit offered by the banks and reduce the credit risk. This is in line with the finding by Naqvi (2011) and Fiore and Tristani (2013) who stated that financial frictions affect aggregate dynamics mainly through their impact on firms' financing costs, which increase in both the deposit rate and in the spread between lending and deposit rates.

In the Indonesian context, there have been many studies conducted on the credit demand by the SMEs and its determinants (Anggrahini, 2002; Soedarto, 2004; Siregar, 2006; and Andriani, 2008). In these studies, both the supply- and demand- side factors affecting credit demand were investigated. Generally, the studies documented that the absorption of loans by the SMEs was significantly influenced by the economic growth, interest rates, inflation, deposit, adequacy capital ratio and non-performing loan. However, these studies only utilized the multiple linear regression analysis based on the ordinary least squares (OLS). This technique of analysis is proper to estimate the time series data, and not for the panel data. Additionally, this technique is only able to measure the long-run effects of the independent variables on the credit demand by the SMEs, while the short-run relationships and long-run equilibrium among the variables could not be explored by this model of estimation. Finally, the multiple regression based on the OLS estimation could not be used to identify the causalities among the variables. Thus, this study tries to fill up the existing gaps in the literature by using the standardized time series analysis, comprising the cointegration and vector error correction model (VECM) to explore the existence of long-run equilibrium and dynamic multivariate causalities among the credit demand, economic growth, interest rate and non-performing loan, taking the SMEs in Aceh, Indonesia as the case of study.

In addition, to the best of our knowledge, there has been no study investigated this issue in Indonesia, particularly in the Province of Aceh. Thus, this study is the first attempt to empirically explore the short-and long-run relationships and dynamic multivariate causalities among the economic growth, interest rate, non-performing loan, and the credit demand by the SMEs in Aceh, Indonesia.

The findings of this study are hoped to shed some lights on the SMEs' management, policy makers, and banking industry in designing a proper strategy to ensure the sustainability of the SMEs and enhance their contribution to the economy, particularly by offering new job opportunities and alleviating poverty in the region. This study is indeed timely to be conducted since the level of poverty of the Aceh's province was higher than the national level. Enhancement of the existing SMEs is hoped to contribute to poverty reduction in the province.

The rest of the study is organized as follows. Section 2 provides a brief overview of the SMEs in Aceh, Indonesia. Section 3 highlights the empirical framework and data on which the analysis of the study is based. The discussion of the findings and its implication were presented in Section 4, followed by the conclusion and recommendations in the last section.

2. The SMEs in Aceh, Indonesia: A Brief Overview

Aceh is a province in Indonesia, which is located at the north-western tip of Sumatra (00°00"- 60 04'30" of the northern latitude and 94 58'34 "-980 15'03" of the eastern longitude), with a capital city of Banda Aceh. Aceh has an area of 56,758.85 km² or 5.68 million ha (12.26% of the size of the Sumatra Island), 12-mile territorial sea with the size of 7,479,802 ha, and with a coastline of 2,666.27 km². Administratively, in 2015, the province has 23 districts/cities, consisting of 276 sub-districts, 6,423 villages. The province has a strategic position as the gateway for national and international trade traffic, connecting the eastern and western part of the world' borders. In the north, Aceh is bordering the Malacca

Strait and the Bengal Bay; in the south, it is bordering the province of North Sumatra and the Indian Ocean; in the west, it is bordering the Indian Ocean; while in the east, it is bordering the Strait of Malacca and North Sumatra province.

Similar to the other 33 provinces of Indonesia, the SMEs in Aceh has been understood as the SMEs in Indonesia nationwide. According to the Law No. 20 of 2008, the SMEs is stand-alone of productive economic enterprise, run by an individual or business entity that is not a subsidiary or branch of the company owned, controlled, or be a part either directly or indirectly by the medium- or large-enterprises. In Indonesia, the SMEs are categorized into three groups. The first one is the micro-sized enterprises, which have the following criteria: (i) it has a net wealth of less than IDR50 million, excluding land and buildings; and (ii) its annual total sales amounting of more than IDR300 million. The second one is the small-sized enterprises, which have the following criteria: (i) its net wealth assets are ranging from IDR50 million to IDR500 million, excluding land and buildings; and (ii) its annual total sales are between IDR300 million to IDR2.5 billion. The last one is the medium-sized enterprise, which has the following criteria: (i) its net wealth is ranging from IDR500 million to IDR10 billion, excluding land and buildings; and (ii) its annual total sales are ranging from IDR2.5 to IDR50 billion.

According to the Central Bureau of Statistics of Indonesia, the micro-, small-, and medium-sized enterprises have less than 5 employees, 5 to 19 employees, and 19 to 99 employees, respectively. In Indonesia, the SMEs have been defined on different bases by the governmental bodies. For example, the Department of Trade and Industry of Indonesia categorized the SMEs based on the value of the initial investment, while the Central Bureau of Statistics of Indonesia grouped them based on the number of workers.

Hitherto, there have been millions of the SMEs in Indonesia had been enjoying credit facilities from the financial institutions either investment credit scheme or working capital loan. Investment credit granted for a long-term period of more than 10-year to the debtor to purchase capital goods such as machinery, vehicles, and equipment. Meanwhile, the working capital loans granted for the purpose of adding the debtor in liquid instruments, such as the procurement of inventory, to pay short-term debts, to buy raw materials as well as other purposes, usually for shorter loan period with a maximum of 3 years. Table 1 reports the figures for credit demand by the SMEs in Aceh, Indonesia during the period 2005-2014.

Table 1: Credit supplied by the banking institutions to the SMEs in Aceh, Indonesia

| Year | Number of the SMEs | Growth (%) | Credit Supplied (IDR000) | Growth (%) |
|------|--------------------|------------|--------------------------|------------|
| 2005 | 29,457 | 2.00 | 4,431,320 | 45.75 |
| 2006 | 30,046 | 2.00 | 4,452,603 | 0.48 |
| 2007 | 44,975 | 49.69 | 6,276,115 | 40.95 |
| 2008 | 48,679 | 8.24 | 8,844,664 | 40.93 |
| 2009 | 50,384 | 3.50 | 5,354,003 | -39.47 |
| 2010 | 42,106 | -16.43 | 5,310,418 | -0.81 |
| 2011 | 53,373 | 26.76 | 6,651,031 | 25.24 |
| 2012 | 55,783 | 4.52 | 7,279,633 | 9.45 |
| 2013 | 54,238 | -2.95 | 7,791,009 | 7.02 |
| 2014 | 54,224 | 0.16 | 7,090,786 | -8.99 |
| Mean | 46,317 | 7.74 | 6,348,158 | 12.06 |

Source: Office of Industry, Trade, Cooperative, and the SMEs, Aceh, and Bank of Indonesia (2015).

As observed from Table 1, the number of the SMEs in Aceh has increased with the average of 7.74% during the period 2005-2014. In 2005-2006, the number of the SMEs only increased by 2.00% amounting to 30,046. The small increase of the SMEs during these years was simply due to the impact of earthquake and tsunami incident hardly hit the province in late 2004. However, in 2007, the number of the SMEs tremendously increased by 49.69% due to the presence and involvement of many foreign institutions and non-governmental organizations (NGOs) both locally and internationally in the province in the recovery, reconstruction and rehabilitation program from the devastated earthquake and tsunami hit Aceh in 2004. Three- year later, in 2010, the number of the SMEs has decreased by 16.43% was simply due to lack of interest of the people who had received financial assistances from

the foreign and local organizations during the emergency relief and post-disaster recovery of rehabilitation and reconstruction program.

Additionally, Table 1 also showed the number of credit offered by the banking institution in Aceh to the SMEs. The number of credit offered by the banks was very much depending on the number of the SMEs existed across the years. On average, the number of credit provided by the banks to the SMEs has increased by 12.06%, amounting to IDR6,3 billion. Thus, it is interesting to explore whether the credit offered by the banks has improved the performance of the SMEs, or vice versa. In other words, whether the banks' credit has improved the SMEs' performance or growth of the SMEs had led the demand for credit to increase. Section 4 of this paper would discuss this issue.

3. Empirical framework

This study empirically explores the short-and long-run relationships between the economic growth, interest rate, non-performing loan and the credit demand by the SMEs in the province of Aceh, Indonesia. It also attempts to investigate both bivariate and multivariate causalities among the variables. For this purposes, the study uses a quarterly data for the period 1995 to 2015, sourced from the *Badan Pusat Statistik* (Central Statistics Bureau) of Aceh, Aceh in Figures, the *Jasa Otoritas Keuangan* (Financial Services Authority), Office of Industry, Trade, Cooperative, and the SMEs of Aceh, and Bank of Indonesia.

Three independent variables investigated in this study, comprising the economic growth, interest rate, and non-performing loan, while the credit demand by the SMEs is the dependent variable. In this study, economic growth is measured by changes in real gross domestic product per capita (2000 = 100), interest rate is measured by interest charged by banks to the SMEs, non-performing loan is measured by the sum of credit upon which the SMEs have not made their scheduled payments for at least 90 days, and credit demand is measured by the sum of money borrowed by the SMEs from the banking institutions. With the exception of interest rate, all other variables were transformed into the natural logarithm.

In this study, the standardized time series technique of cointegration and vector error correction model (VECM) are adopted to explore both short- and long-run relationships among the variables as well as their bivariate and multivariate dynamic causalities. Thus, the following main model, comprising the dependent variable of credit demand (CD) by the SMEs and the independent variables of economic growth (GDP), interest rate (INT), and non-performing loan (NPL), was estimated in this study.

$$CD_t = \beta_0 + \beta_1 GDP_t + \beta_2 NPL_t + \beta_3 INT_t + \pi_t \tag{1}$$

In estimating the model, the following standardized procedures for the time series analysis were occupied. The first step is to conduct the unit root test to ensure the stationarity of each variable using the following Augmented Dickey-Fuller (ADF) and Phillips and Perron (PP) tests.

$$\Delta Y_t = \beta_1 + \beta_2 t + \delta Y_{t-1} + \alpha_i \sum_i^m \Delta Y_{t-1} + \varepsilon_t \tag{2}$$

$$\Delta Y_t = \eta_0 + \eta_1 t + \delta Y_{t-1} + v_t \tag{3}$$

After ensuring all variables were non-stationarity and having the same order of integration, the Granger bivariate causality (Engle and Granger, 1987) test was conducted in the second step. To test the null hypothesis that X does not Granger-cause Y, one first finds the proper lagged values of Y to include in a univariate autoregression of Y, as follows:

$$Y_t = \alpha_0 + \alpha_1 Y_{t-1} + \alpha_1 Y_{t-2} + \dots + \alpha_i Y_{t-m} + \xi_t \tag{4}$$

Next, the Equation (3.4) is augmented by incorporating the lagged values of X, as follows:

$$Y_t = \alpha_0 + \alpha_1 Y_{t-1} + \alpha_1 Y_{t-2} + \dots + \alpha_i Y_{t-m} + \delta_p X_{t-p} + \dots + \delta_q X_{t-q} + \xi_t \tag{5}$$

Since the Equations (4) and (5) incorporated the possibility of the lagged values to influence the changes in other variables, thus the third step of estimation was to determine the

lag-length of the variables included in the model based on the Akaike (1974) Information Criterion (AIC).

The next step was to examine the existence of long-run equilibrium among the variables using the Johansen and Juselius (1990) approach. In this study, tests of the Likelihood Ratio Trace (LRT) and the Maximum Eigenvalue (ME) were used to determine the number of cointegrating vectors, as follows:

$$\text{LRT} = -T \sum_{i=i+1}^n \ln(1 - \mu_i) \quad (6)$$

$$\text{ME} = -T \ln(1 - \mu_r) \quad (7)$$

Finally, the multivariate causalities among the variables based on the VECM were conducted. In so doing, the estimated model of the Equation (3.1) could be re-formulated as follows:

$$\begin{bmatrix} \Delta CD \\ \Delta GDP \\ \Delta NPL \\ \Delta INT \end{bmatrix} = \begin{bmatrix} \delta_0 \\ \delta_1 \\ \delta_2 \\ \delta_3 \end{bmatrix} + \sum_{i=1}^k \Gamma_i \begin{bmatrix} \Delta CD \\ \Delta GDP \\ \Delta NPL \\ \Delta INT \end{bmatrix}_{t-k} + \Pi \begin{bmatrix} CD \\ GDP \\ NPL \\ INT \end{bmatrix}_{t-1} + \begin{bmatrix} \varepsilon_{t0} \\ \varepsilon_{t1} \\ \varepsilon_{t2} \\ \varepsilon_{t3} \end{bmatrix} \quad (8)$$

From the Equation (8), two channels of causalities could be observed, namely: (i) the standard Granger tests to examine the joint significance of the coefficients of the lagged independent variables; and (ii) the adjustment of the dependent variable to the lagged deviations from the long-run equilibrium path, represented by the error correction term (ECT). From these tests, four patterns of causal interactions among pairs of the variables could be identified, that is: (i) a unidirectional causality from X to Y; (ii) a unidirectional causality from Y to X; (iii) bidirectional causality; and (iv) an independent causality between variables (Majid, 2008; and Majid and Kassim, 2015).

4. Empirical findings and discussion

Preliminary findings

Before the study discusses main findings on the short- and long-run relationships between economic growth (GDP), non-performing loans (NPL), interest rates (INT) and credit demand (CD) by the SMEs in Aceh province, Indonesia, the descriptive statistics and coefficients of correlation would be firstly presented. Table 2 portrayed the descriptive statistics for all investigated variables during the 1995 to 2015 (83 observations). On the average, the number of CD by the SMEs, GDP, NPL, and INT in the province was IDR3.98 trillion, IDR28.54 trillion, IDR3.52 billion, and 15.03% percent, respectively. The maximum value for CD was IDR8.84 trillion, while the minimum value was IDR6.59 trillion. The maximum value for GDP was IDR44.68 trillion, while the minimum value was IDR2.78 trillion. The maximum value for NPL was IDR3.63 billion, whereas the minimum value was IDR1.01 billion. Finally, the maximum level of INT was 58.76%, while the minimum value was 10.5%. The table also showed that on the average the number of NPL was 8.84% out of the total CD by the SMEs in Aceh, Indonesia. These figures showed that the banking institutions in Aceh were unhealthy since their NPLs were above 3%. According to Heffernan (2015), for the banks to be healthy, they should have NPL ranging from 1% to 3%.

Table 2. Descriptive statistics

| | CD | GDP | NPL | INT |
|-------------|-----------|------------|-----------|----------|
| Mean | 3,985,887 | 28,544,091 | 352,459.0 | 15.039 |
| Median | 3,480,000 | 32,646.010 | 246,751.4 | 12.510 |
| Maximum | 8,844,664 | 44,677.163 | 362,560.0 | 58.760 |
| Minimum | 6,594,880 | 2,781.620 | 101,186.6 | 10.500 |
| Std. Dev. | 2,795,659 | 11,783,877 | 301,027.5 | 9.010 |
| Skewness | 0.253 | -0.875 | 0.908 | 4.362 |
| Kurtosis | 1.439 | 2.673 | 2.480 | 23.113 |
| Jarque-Bera | 9.305 | 10.963 | 12.344 | 1662.221 |
| Probability | 0.009 | 0.004 | 0.002 | 0.000 |

Table 3 showed the correlation coefficients between the variables. With the exception of correlation between the NPL and GDP, all other variables have correlated with one to another. The highest positive correlation existed between the CD and NPL, whereas the lowest one was between the NPL and GDP. On the other hand, the negative correlations were found between the INT and other variables, i.e., CD, GDP, and NPL. This finding implied that the higher level of interest rate associated with the lower credit demand, non-performing loan and lower level of economic growth. The expansionary monetary policy could be used to promote the development of the SMEs in Aceh, Indonesia and it, in turns, positively contribute to the provincial economic growth.

Table 3. Results for coefficients of correlation test

| Variables | CD | GDP | NPL | INT |
|-----------|----------------------|----------------------|---------------------|-------|
| CD | 1.000 | - | - | - |
| GDP | 0.202** [0.034] | 1.000 | - | - |
| NPL | 0.773*** [0.000] | 0.109 [0.163] | 1.000 | - |
| INT | -0.321*** [0.002] | -0.299*** [0.003] | -0.245** [0.013] | 1.000 |

Note: *** and ** indicate significant at the 1% and 5% levels, respectively. Figures in the squared bracket [.] show the p-value.

Unit root tests

Before the study further investigated the causalities among variables as well as their short- and long-run relationships, the stationarity test would be firstly conducted. Table 4 reported the unit root tests based on the Augmented Dickey-Fuller (ADF) and Phillips-Perron (PP). Based on the tests, the study found that all variables were not stationary at the level, I(0), but became stationary after taking the first difference, I(1) at the 1% level of significance. Thus, this finding allows us to further proceed to the next step of estimation, namely to conduct the cointegration test. This test is aimed at exploring the existence of long-run equilibrium among the variables.

Tabel 4. Results of the unit root tests

| Variables | Level | | First Difference | |
|-----------|-------------------|-------------------|-----------------------|-----------------------|
| | ADF | PP | ADF | PP |
| CD | -1.317 [0.618] | -1.114 [0.707] | -10.994*** [0.000] | -11.016*** [0.000] |
| GDP | -2.608 [0.278] | -2.941 [0.156] | -5.126*** [0.000] | -8.164*** [0.000] |
| NPL | -0.376 [0.907] | -1.851 [0.354] | -9.332*** [0.000] | -14.374*** [0.000] |
| INT | -1.438 [0.139] | -1.438 [0.139] | -7.690*** [0.000] | -7.704*** [0.000] |

Note: *** indicates significant at the 1% level. Figures in the squared bracket [.] show the p-value.

Cointegration tests

Table 5 provided the findings for the cointegration test based on the Johansen and Juselius (1990) approach. The study found that there was a cointegration among the CD, GDP, NPL and INT, both using Trace statistics and Max-Eigen statistics. Only one cointegrating vector was found among the variables using the Trace statistics test at the 1% level of significance, while two cointegrating vectors were found among the variables using the Max-Eigen statistics at the 5% level of significance. This finding indicated that there was an existence of long-run equilibrium among the variables. In other words, the credit demand by the SMEs in Aceh, Indonesia has a tendency to move together in the long-run with other variables, i.e., non-performing loan, economic growth, and interest rates. Understanding the movement

of one variable in the system could be used to predict the movement of other variables in the long-run.

Table 5. Results for the cointegration tests

| Null Hypothesis | Trace Test | | | Max-Eigen (ME) Test | | |
|-----------------|-----------------|----------------|-------|---------------------|----------------|-------|
| | Trace Statistic | Critical Value | | ME Statistic | Critical Value | |
| | | 1 % | 5 % | | 1 % | 5 % |
| $r \leq 0$ | 57.67*** | 47.21 | 54.46 | 30.66** | 27.07 | 32.24 |
| $r \leq 1$ | 27.00 | 29.68 | 35.65 | 20.20 | 20.97 | 25.52 |
| $r \leq 2$ | 4.79 | 15.41 | 20.04 | 3.84 | 14.07 | 18.63 |
| $r \leq 3$ | 0.94 | 3.76 | 6.65 | 0.94 | 3.76 | 6.65 |

Note: *** and ** indicate significant at the 1% and 5% levels, respectively

Bivariate granger causality

Since the investigated variables were stationarity at the first difference and cointegrated, thus it fulfilled both necessary and sufficient conditions for the Vector Error Correction Model (VECM) to be adopted in this study to empirically estimate the short- and long-run relationships among the variables. However, before the results from the VECM would be presented, the study firstly investigated the bivariate Granger causality between the variables. In so doing, the model incorporated lagged values of the variables, where the optimal lag-length to be included in the model was determined based on the Akaike (1974) Information Criteria (AIC). In this study, based on the smallest final prediction error of the AIC, the lag-length to be included was 5.

Table 6 provided the findings for the bivariate Granger causality test between variables. The study documented that there was a unidirectional Granger causality existed from the GDP to CD, and from the INT to GDP at the 10% and 5% levels of significance, respectively. These findings implied that when the economy grows, the demand for credit by the SMEs increases. This is partly due to the higher income of the citizens that led them to demand more the output and services produced by the SMEs, which in turns, caused an increase in the profits earned by the SMEs. Having higher profit, the SMEs tended to increase their credit demand. The credit supplied to the SMEs would promote the economy to grow, especially for countries or regions in which their financial system was dominated by the banking institutions. The role of the banks as the financial intermediary institutions becomes more important due to their channels of funds to the SMEs that, in turns, triggered an economic growth (Berger and Udell, 2006.). The loan provided to the SMEs with the aim of improving local communities to develop would contribute to the growth of both regional and national economies.

Table 6. Results for the bivariate granger causality test

| Null Hypothesis | F-Statistics | Prob. |
|--------------------------------|--------------|-------|
| GDP does not Granger Cause CD | 2.029* | 0.085 |
| CD does not Granger Cause GDP | 0.855 | 0.515 |
| NPL does not Granger Cause CD | 1.082 | 0.378 |
| CD does not Granger Cause NPL | 1.567 | 0.181 |
| INT does not Granger Cause CD | 2.242** | 0.050 |
| CD does not Granger Cause INT | 4.072*** | 0.002 |
| NPL does not Granger Cause GDP | 0.828 | 0.533 |
| GDP does not Granger Cause NPL | 0.888 | 0.494 |
| INT does not Granger Cause GDP | 2.696** | 0.028 |
| GDP does not Granger Cause INT | 1.667 | 0.154 |
| INT does not Granger Cause NPL | 0.409 | 0.840 |
| NPL does not Granger Cause INT | 0.321 | 0.898 |

Note: ***, ** and * indicate significant at the 1%, 5% and 10% levels, respectively. The lag-length included in the model was equal to 5 based on the AIC.

Furthermore, the study also found the unidirectional Granger causality from the INT to GDP at the 5% level of significance, showing the importance of interest rate as the monetary

policy tool to stabilize economic growth. Meanwhile, the bidirectional Granger causality only existed between the NPL and CD, at least at the 5% level of significance. These two variables Granger caused each other when the CD increased, the NPL tended to be higher, and vice versa. However, if the credit offered by the banks to the SMEs were not productively utilized, it would increase the credit risk (Thiagarajan et al., 2011). In this context, the credit risk was defined as the potential failure of the SMEs to repay back their obligations in accordance with their agreement with the credit providers, which was reflected in the level of NPL (Ahmad and Arif, 2007). During the higher level of interest rates, the SMEs tended to reduce their credit demand, thus lowering the potentiality of having higher NPL (Bonifirm, 2003).

Multivariate causality test

Having provided an insight into the bivariate Granger causality between the variables, the findings from the multivariate analysis based on the VECM framework would be reported in this section. This model of estimation permits us to identify both short- and long-run patterns of causality. If the variables were found to be cointegrated, thus any deviations from the long-run equilibrium would, in the short run, restore back to its long-run equilibrium.

Table 7 presented findings for the short- and long-run relationships among the credit demand (CD), economic growth (GDP), non-performing loan (NPL), and interest rates (INT) based on the VECM. The study documented that at least one channel of Granger causality was active, either in the short-run through joint tests of lagged differences or in the long-run via statistically significant error correction terms (ECTs). This further implied that when there was a deviation from equilibrium cointegrating relationships as measured by the ECTs, it was mainly the changes in these variables that adjust to clear the disequilibrium. However, it is important to note, at this juncture, that the finding of cointegration among the variables merely implied their long-run relationship, while it implied causality, but it was unable to discover the causal directions among the variables.

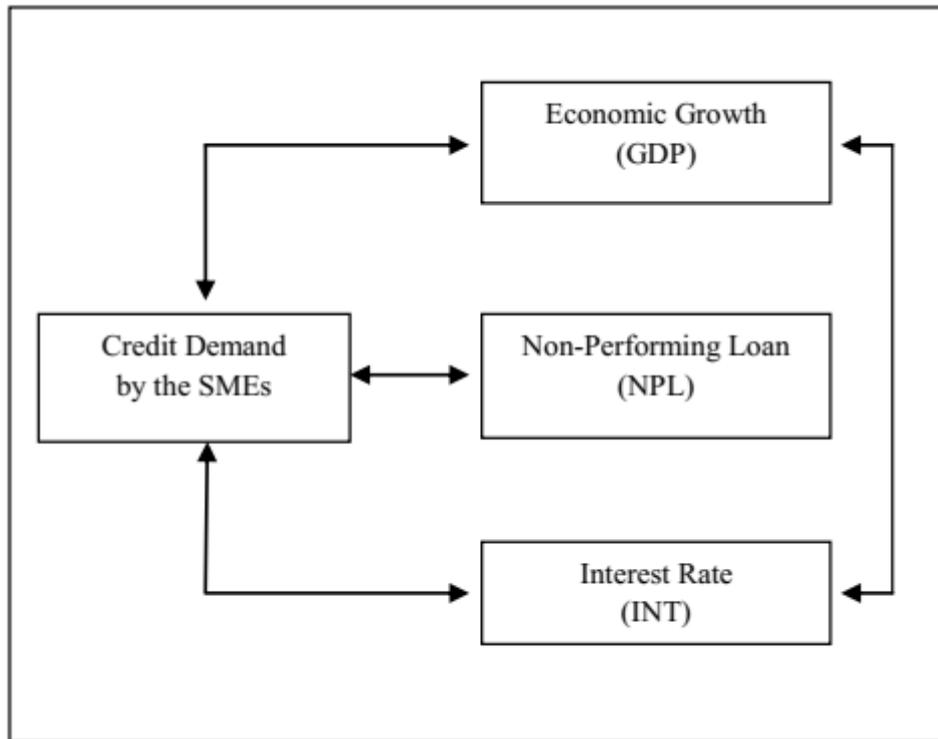
Table 7. Results for the multivariate causality analysis based on the VECM

| Model | Dependent Variables | Independent Variables | | | | (t-statistics) ECT _{t-1} | Diagnostic test |
|-------|---------------------|-----------------------|---------------------|-------------------|---------------------|--------------------------------------|--|
| | | [F-statistics] | | | | | |
| | | ΔCD | ΔGDP | ΔNPL | ΔINT | | |
| 1 | ΔCD | - | 3.461** [0.006] | 1.853* [0.097] | 7.429*** [0,000] | -0.528** (-1.721) | Adj-R ² = 0.634 F = 3.461** |
| 2 | ΔGDP | 7.731*** [0.000] | - | 0.555 [0.788] | 7.204*** [0.000] | -0.706*** (-3.082) | Adj-R ² = 0.743 F = 7.732*** |
| 3 | ΔNPL | 1.853* [0.097] | 0.515 [0.819] | - | 0.513 [0.795] | -0.284 (-0.466) | Adj-R ² = 0.622 F = 1.851* |
| 4 | ΔINT | 3.009* [0.013] | 7.045*** [0.000] | 0.675 [0.905] | - | -0.625*** (-3.758) | Adj-R ² = 0,50 F = 2.57** |

Note: ***, ** and * indicate significant at the 1%, 5% and 10% levels, respectively.

Figures in the squared parentheses [.] and parentheses (.) are the probabilities for the F-statistics and t-statistics, respectively. The lag-length included in the model was equal to 5, based on the AIC.

The study documented that the ECTs for Models 1, 2, and 4 confirmed the presence of long-run relationships among the variables. Particularly, this implied that any deviations from the long-run equilibrium relationships among variables were mainly due to the changes in credit demand, economic growth, and interest rates. Differently put, these variables bore the brunt of short-run adjustment to the long-run equilibrium with the fast speed of adjustment, ranging from -0.528 to -0.706. This indicated that the last period disequilibrium, on the average, corrected by 52.8 -70.6 percent in the following quarter. The summary of findings from Table 7 is summarized in Figure 1, as follows.

Figure 1: Multivariate causalities based on the VECMs

Furthermore, by having acceptable of non-performing loan offered to the SMEs by the banks in the province via the expansionary monetary policy (low-interest rates) would promote the provincial economic growth (Fiore and Tristani, 2013). These findings highlighted the important role of the banking institutions in offering loans to enhance the SMEs (Distinguin et al., 2016), and in turns, their positive contribution to the economic growth. These findings further supported the finding by Pasha (2009) on the significant role of the banks in promoting the level of economic activity in the region. In enhancing the SMEs as one of the pivotal contributors to regional income and as one of the pillars of economic growth, the government should design a proper strategy for the banks to offer sufficient amount of loans to the SMEs (Distinguin et al., 2016). By having an easy access to the banks, the SMEs would get sufficient funds as one of the necessary requirements for them to increase their levels of productivity and competitiveness (Ahmedova, 2015). Nuryakin and Warjiyo (2006) opined that conducive business environment characterized by higher levels of economic growth and lower level of interest rates would increase the demand for credit by the SMEs with the acceptable level of the non-performing loan.

Based on the above findings, several policy recommendations could be provided in order to ensure the sustainability of the SMEs and to further enhance their contribution to the provincial economic growth. Firstly, due to the higher level of NPLs of the banking loans to the SMEs, a proper strategy need also be implemented. Otherwise, the number of loans provided by the banking institutions to the SMEs would be restricted. The government should encourage the banks to offer their loans to the SMEs by determining the minimum level of the loans to be channelled to the SMEs and providing them with tax incentives. The government should also initiate to establish the SMEs Bank in the near future. Besides, in giving their credits, the banks should carefully select the SMEs by using good credit management principles. The Public Enterprise Credit Guarantee of Indonesia, a State-Owned Company that provided credit guarantee for the SMEs at the national level in Indonesia should further be enhanced. At the provincial level, the government of Aceh should also take imitative to establish credit guarantee institutions to ensure the repayment of the bank loans taken by the SMEs, especially if the loans provided to risky economic sectors. As a result, the banks would not hesitate to have the higher level of the NPLs since the loans have been guaranteed by the local government.

Secondly, since the interest rates were bidirectionally caused the NPLs, thus the government should implement a proper expansionary monetary policy by controlling the level

of interest. Higher interest rates caused difficulty for the SMEs to apply for the new bank loans and to repay back their existing bank loans. The government might provide interest subsidy facility for the SMEs to borrow from the banks and for the banks to channel their loans to the SMEs. The central bank of Indonesia, Bank Indonesia should adjust the lending rate for the SMEs become more attractively and competitively. For this purpose, the bank should also lower their cost of funds by implementing financial soundness and prudent management. At the national level, the lending rate for the SMEs was 10.7 percent, which was higher than the lending rates in other ASEAN markets. Consequently, the SMEs in Indonesia have been less competitive compared to the SMEs in other ASEAN markets. It is suggested here that the lending rate for the SMEs should be no higher than two digits.

Thirdly, the government should design a proper strategy to enhance the productivity and competitiveness of the SMEs by stabilizing the interest rates with the aim to reduce the NPL and, in turns, to promote the economic growth. Additionally, the government should also maintain the stability of input prices by regulating and controlling the distribution channels for raw materials needed by the SMEs. Having stability of input prices, the SMEs could easily increase their efficiency, productivity and penetrate their product and services into the markets at the competitive prices. Remarkably, we found that growth paths that are most commonly used by SMEs (market penetration and increasing efficiency) hardly lead to growth. An increase in efficiency and market penetration would hardly boost the SMEs to growth (Wakkee et al., 2015) and lead the economy to growth. As a result, it might attract the banking institutions to offer more loans to the SMEs due to an increased demand for working capital needed by the SMEs to expand their business activities in meeting an increased market demand due to the higher level of people's income.

Finally, the government should design various incentives for the SMEs in the forms of providing: lower cost and shorter time for the new SMEs in applying for their business licenses; tax relief; technical and business assistances; marketing their product to foreign markets; and business assurance and protection. In addition, the government should also provide infrastructures to support business activities and enhance market access for the SMEs, such as establishing roads, ports, and transportation facilities connecting the SMEs to marketplaces.

5. Conclusion

This study empirically explored the short- and long-run relationships between economic growth, non-performing loans, interest rates and the credit demand by the small and medium enterprises (SMEs) in Aceh province, Indonesia. It also attempted to investigate the existence of long-run equilibrium and dynamic multivariate causalities among the variables. The quarterly data for the period 1995 to 2015 were utilized and analyzed by the standardized times series analyses of cointegration and vector error correction model (VECM). The study documented that there was a cointegration among the economic growth, non-performing loans, interest rates and the credit demand, implying the existence of long-run equilibrium among the variables. In addition, the study found the existence of dynamic causalities among the variables. Particularly, in short-run, the study found a unidirectional causality from economic growth to credit demand, a bidirectional causality between interest rates and credit demand, while no causality existed between non-performance loan and credit demand by the SME in Aceh, Indonesia. These findings implied that in order to enhance the SMEs, the government should focus on promoting the economic growth by managing the interest rates in the province.

To further enhance the contribution of the SMEs to the Aceh's economic growth, the government should encourage the banks to offer more loans to the SMEs by determining the minimum level of the loans to be channelled to the SMEs and providing them with tax incentives. It is also suggested for the government to provide interest subsidy facility for the SMEs to borrow from the banks and for the banks to channel their loans to the SMEs. The central bank of Indonesia, Bank Indonesia should adjust the lending rate for the SMEs become more attractively and competitively. Finally, the government should design various incentives for the SMEs in the forms of providing tax relief, technical and business assistances, and business assurance.

While this study has provided clear evidence on the importance of the credit demand by the SMEs to the economic growth of Aceh, Indonesia, there are few areas for extensions that can further contribute toward refining the literature in this area. This includes undertaking a more robust analysis using a more extended period of study. More detailed aspects of the SMEs could be explored by examining the contribution of the SMEs by economic sectors. This would allow the identification of the specific sectors of the SMEs that are contributing more to the economic growth. Future researches should consider a wider aspect of macroeconomic determinants in affecting the contribution of the SMEs to the economy, which could perhaps provide a clearer picture for the policy recommendations. Additionally, the enrichment of the findings could also be done by including the SMEs across the ASEAN countries into the analysis to enable comparison across countries in the region for more enriching policy recommendations, particularly on enhancing their productivity and competitiveness as well as their contribution to promoting the national economies.

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