THE IMPACT OF BOPO, CAR AND LDR ON SUPPLY OF CREDIT IN STATE-OWNED BANKS OF INDONESIA, 2000-2016

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ABSTRACT

In 2016 the credit supply of State-owned Banks of Indonesia has contributed to total banking credit supply about 39.11%. In addition, in 2000-2016 the credit supply of State-owned Banks of Indonesia tend to increase. This research aims to analyze the impact of operational cost of operating income (BOPO), Capital Adequacy Ratio (CAR), and Loan to Deposit Ratio (LDR) on supply of credit in State-Owned Banks of Indonesia in 2000-2016. It refers to Nuryakin and Warjiyo (2007), Satria and Bagus (2010), Febrianto and Muid (2013), Khasanah and Meiranto (2015), Devi (2016), Amelia (2017), Haryanto and Widyarti (2017), Hyun and Rhee (2011), and Lemmon and Michael (2010). Furthermore, this research employs Fixed Effect Model (FEM). The research results show that BOPO has a negative impact and significant on supply of credit, LDR has a positive impact and significant on supply of credit, while CAR has no impact on supply of credit. The recommendation of this research covers: banks should held down operational cost, banks should manage risks on CAR, and banks should keep a level of LDR.

Keywords: Supply of Credit, State-Owned Bank, FEM

JEL classification: E51, G21

1. INTRODUCTION

The development of credit supply of state-owned banks of Indonesia tends to fluctuate in 2000-2016. In 2008-2009 the credit supply hold down. According to Sihono (2009) it was determined by economic crisis in USA. However, in 2010 the credit supply has increased.

Table 1 displays supply of credit of state-owned banks of Indonesia in 2016. The proportion of credit supply and number of bank of state-owned bank are 39.11% and 3.42% respectively. It means that state-owned banks of Indonesia have significant contribution to the banking credit market. The highest proportion of credit supply and number of bank were employed by foreign exchange bank. The values of those proportions are 41.29% and 27.35% respectively.

Table 1
Supply of Credit of State-Owned Banks in Indonesia, 2016

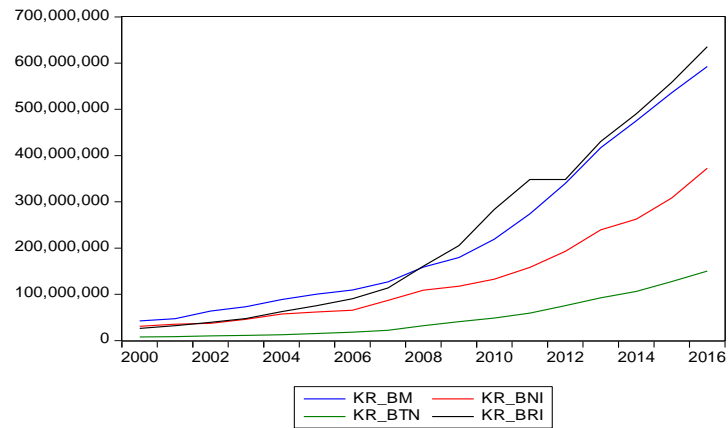| Bank	Supply of Credit (Billion IDR)	Share of Credit Supply (%)	Number of Bank	Share of Number of Bank (%)
State-Owned Bank	1,765,198	39.11	4	3.42
Foreign Exchange Bank	1,863,593	41.29	32	27.35
Non Foreign Exchange Bank	50,946	1.13	30	25.64
Local government bank	359,327	7.96	26	22.22
Joint venture bank	221,074	4.90	15	12.82
Foreign Bank	253,276	5.61	10	8.55
Total	4,513,414	100	117	100

Source: www.ojk.go.id

Figure 1. Supply of Credit of State-Owned Banks in Indonesia, 2000-2016 (Billion IDR)
Source: Bank Indonesia (processed)

Figure 1 depicts supply of credit of state-owned banks of Indonesia in 2000-2016. The state-owned banks cover Bank Mandiri, BNI, BRI, and BTN. The growth of credit supply of Bank Mandiri, BNI, BRI, and BTN were 12.98%, 11.04%, 23.09%, and 18.58% in 2000-2016 respectively. The highest and lowest growth of credit supply in Bank Mandiri were 0.35% (2002) and 0.09% (2006) respectively. The highest and lowest growth of credit supply in BNI were 0.33% (2007) and 0.06% (2006) respectively. The highest and lowest growth of credit supply in BRI were 0.42% (2008) and 0% (2012) respectively. Furthermore, the highest and lowest growth of credit supply in BTN were 0.43% (2008) and 0.09% (2003) respectively.

Figure 2. The Development of BOPO, CAR, and LDR in State-Owned Banks of Indonesia, 2000-2016 (%)
Source: Bank Indonesia (processed)

Figure 2 describes growth of BOPO, CAR and LDR in Bank Mandiri were -0.15%, -0.25%, and 2.27% in 2000-2016 respectively. The highest and lowest growth of BOPO were 0.44% (2005) and -0.17% (2007) respectively. The highest and lowest growth of CAR were 0.17% (2003) and -0.24% (2008) respectively. Moreover, the highest and lowest growth of LDR were 0.42% (2002) and -0.08% (2001).

The growth of BOPO, CAR, and LDR in BNI were 0.26%, 0.46%, and 1.43% in 2000-2016 respectively. The highest and lowest growth of BOPO were 0.13% (2003) and -0,18% (2004). The highest and lowest growth of CAR were 0.38% (2010) and -0.18% (2008) respectively. However, the highest and lowest growth of LDR were 0.22% (2007) and -0.09% (2006) respectively.

The growth of BOPO, CAR, and LDR in BTN were -0.8%, 1.5%, and 1.13% in 2000-2016 respectively. The highest and lowest of BOPO were 0.09% (2014) and -0.11% (2004) respectively. The highest and lowest growth of CAR were 0.33% (2004) and -0.24% (2008) respectively. In addition, the highest and lowest growth of LDR were 0.16% (2005) and -0.06% (2001) respectively.

The growth of BOPO, CAR, and LDR in BRI were 0.29%, 0.64%, and 0.64% in 2000-2016 respectively. The highest and lowest growth of BOPO were 0.08% (2014) and -0.14% (2004) respectively. In addition, the highest and lowest growth of CAR were 0.67% (2003) and -0.16% (2007) respectively. Nevertheless, the highest and lowest growth of LDR were 0.21% (2004) and -0.08% (2014) respectively.

The empirical research has been conducted by Satria and Subekti (2010), Khasanah and Meiranto (2015), Febrianto and Muid (2013), Devi (2016), Ganic (2014), and Lemmon and Michael (2010) identified that BOPO, CAR, and LDR have impact on supply of credit. Those researches became references to employ this research. In addition, the research problem in this research covers: a) Does BOPO impact on supply of credit in state-owned banks of Indonesia in 2000-2016?, b) Does CAR impact on supply of credit in state-owned banks of Indonesia in 2000-2016?, and c) Does LDR impact on supply of credit in state-owned banks of Indonesia in 2000-2016?.

1.1 Bank and Credit

The definition of bank can refer to Act No. 10/1998 on Banking that bank is an enterprise in which collecting (in the form saving) and distributing (in the form credit) fund from customers for human being. In addition, bank is also an enterprise that conducts a business in conventional and/or sharia rule.

Credit is a transaction for lending/borrowing money in which consists right and obligation between parties (bank and customer) in a certain period Act No. 10/1998 and Iskandar (2013). It means that bank will give money to customer (debtor). Furthermore, the debtor will pay money and interest rate to bank in a certain period.

Binangkit (2014) argues that credit supply can be determined by supply side of credit. It can refer to some theories such as Melitz and Pardue (1973) and Bernanke and Blinder. Melitz and Pardue (1973) in Binangkit (2014) explain that the model of credit supply can be affected by reserve, interest rate, opportunity cost, and deposit cost. The model was completed by Warjiyo in Binangkit (2014) that supply of credit can be determined by third party fund (DPK), CAR, non-performing loan (NPL), LDR, and BOPO. Meanwhile, Bernanke and Blinder in Binangkit (2014) describe that supply of credit will be determined by credit interest rate, bond interest rate, number of deposit, and minimum reserve.

Supply of credit in banking industry is controlled by Bank Indonesia (before 2015) and Financial Service Authority (after 2015). Financial Service Authority (FSA) also supervises credit market in Indonesia. Some policies on supply of credit are as follows: (1) Regulation No. 17/12/PBI/2015 on Credit or Financing by Commercial Bank and Technical Assistance to Develop SMEs, (2) Decision Letter No. 42/SEOJK.03/2016 on Measurement on Risk Weighted Asset for Credit Risk Using Standard Approach.

2. RESEARCH METHOD

This research uses secondary data collected from Bank Indonesia (www.bi.go.id) and Financial Service Authority (www.ojk.go.id). The data cover supply of credit, operational cost of operating income (BOPO), Capital Adequacy Ratio (CAR), and Loan to Deposit Ratio (LDR) in State-Owned Banks (Bank Mandiri, BNI, BRI, and BTN) of Indonesia in 2000-2016. Number of observation is 68 data.

The research method was employed is Panel Data with Fixed Effect Model (FEM). Gujarati and Porter (2009:636) explain that "panel data such as pooled data (pooling of time series and cross section observations), combination of time series and cross section data, micro panel data, longitudinal data, event history analysis, and cohort analysis". The analysis of panel data model is displeased at Figure 3.
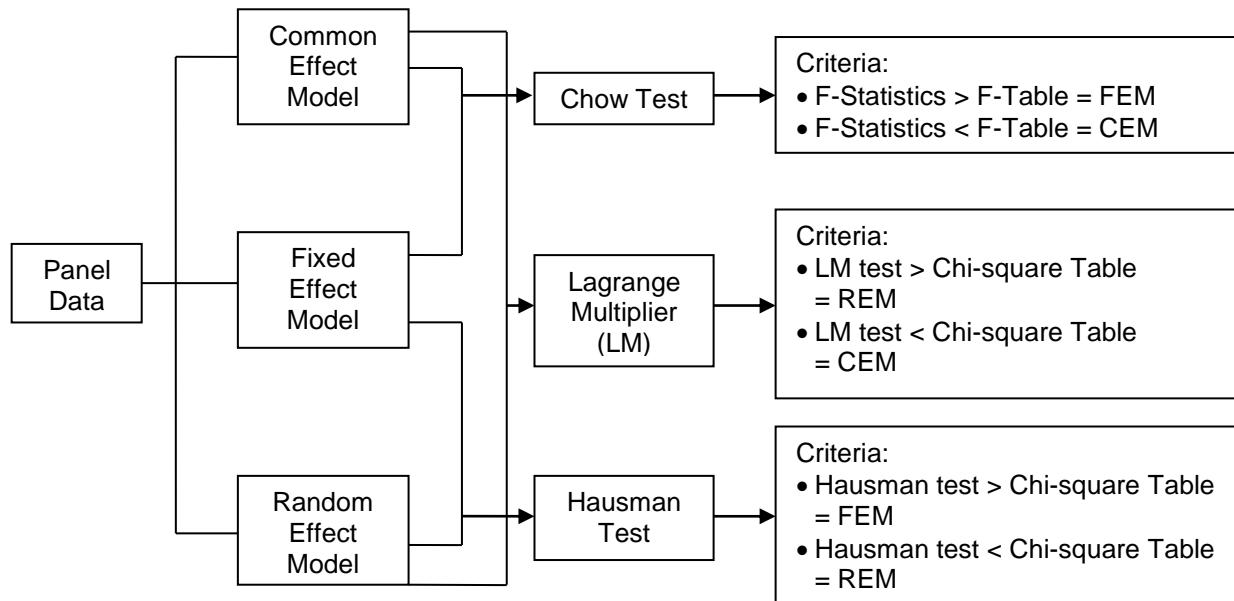

Figure 3. Panel Data Model
Source: Widarjono (2013, processed) in Puspitasari and Cahyadin (2014)

The estimation model in this research refers to Nuryakin and Warjito (2007), Satria and Bagus (2010), and Lemmon and Michael (2010). The equation of panel model is as follows:

$$LogKr_{it} = \alpha + \beta_1 BOPO_{it} + \beta_2 CAR_{it} + \beta_3 LDR_{it} + \varepsilon_{it}$$

where:

LogKr	= Supply of Credit
BOPO	= Operational cost of operating income
CAR	= Capital Adequacy Ratio
LDR	= Loan to Deposit Ratio
α	= intercept
β	= coefficient
i	= Bank Mandiri, BNI, BTN, and BRI
t	= 2000-2016
ε	= *error term*

3. RESULTS AND DISCUSSION

3.1 Results

3.1.1 The Development of Credit Supply in State-Owned Bank

The development of credit supply of state-owned banks of Indonesia tends to increase. According to Warjiyo (2004) bank can be categorized an efficient bank when percentage of credit supply tends to increase. In 2000-2016 Bank Mandiri can increment supply of credit. It was impacted by (www.bankmandiri.co.id): customer's trust, and positive growth of credit supply.

In 2000 the highest and lowest supply of credit were IDR42,387,615 billion (Bank Mandiri) and IDR7,673,718 billion (BTN). However, in 2016 the highest and lowest supply of credit were IDR592,669,270 billion (Bank Mandiri) and IDR150,221,960 billion (BTN). The supply of credit in BRI in 2000 and 2016 were IDR26,367,171 billion and IDR635,304,499 billion. In addition, in the same time supply of credit in BNI were IDR30,944,601 billion and IDR372,621,478 billion.

3.1.2 The Development of BOPO in State-Owned Bank

The development of BOPO of state-owned banks of Indonesia tends to fluctuate. BTN is one of state-owned banks that has high value of BOPO. According to (www.bankbtn.co.id) can be inferred that: in 2014 each of staff in BTN can contribute to business profit was IDR195 million, inefficiency of business and low level of market expansion.

In 2000 the highest and lowest BOPO of state-owned banks were 100% (BTN) and 94% (Bank Mandiri) respectively. However, in 2016 the highest and lowest BOPO were 82% (BTN) and 68% (BRI) respectively. It means that state-owned banks do not able to reduce operational cost to obtain certain income yet.

3.1.3 The Development of CAR in State-Owned Bank

The development of CAR in state-owned banks of Indonesia tends to fluctuate in 2000-2016. BRI has high level of CAR. It was determined by (www.bankbri.co.id): BRI can manage business risk well, and core of capital more than 80%.

In 2000 the highest and lowest CAR of state-owned banks were 28% (Bank Mandiri) and 8% (BTN) respectively. In contrast, in 2016 the highest and lowest CAR were 23% (BRI) and 19% (BNI) respectively. It means that state-owned banks did not able to increase capital gradually yet.

3.1.4 The Development of LDR in State-Owned Bank

The development of LDR of state-owned banks of Indonesia tends to increase in 2000-2016. BTN has significant level of LDR. It was supported by (www.bankbtn.co.id): high number of credit supply, and customer's trust.

In 2000 the highest and lowest LDR of state-owned banks of Indonesia were 53% (BRI) and 26% (Bank Mandiri). Moreover, in 2016 the highest and lowest LDR were 102% (BTN) and 85% (Bank Mandiri). It means that state-owned banks have significant contribution to credit market in Indonesia.

3.1.5 FEM Result

Chow and Hausman test result indicate that Fixed Effect Model (FEM) is the best model in this research. It can be concluded from F-statistics and Chi-square statistics were 40.247 (Table 2) and 120.743 (Table 3) respectively.

Table 2
Chow Test - *Likelihood Ratio*

Effects Test	Statistic	Prob.
Cross-section F	40.247721	0.0000
Cross-section Chi-square	74.237003	0.0000

Source: Secondary Data (processed)

Table 3
Correlated Random Effects - Hausman Test

Test cross-section random effects			
Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	120.743163	3	0.0000

Source: Secondary Data (processed)

Table 4
FEM Result on Credit Supply of State-Owned Banks in Indonesia

Variabel	Coefficient	t-Statistic	Probability
C	7.317030	20.33064*	0.0000
BOPO?	-0.007241	-2.174156**	0.0336
CAR?	0.002757	0.435638	0.6646
LDR?	0.016835	9.758606*	0.0000
Fixed Effects (Cross)			
_BM—C	0.403985		
_BNI—C	0.176000		
_BTN—C	-0.673268		
_BRI—C	0.093284		
R-squared	0.881031		
Adjusted R-squared	0.869329		
F-test	75.28971		0.000000

Source: Secondary Data (processed)

where:

Dependent Variable = LogKr
* α= 1%, ** α = 5%, *** α = 10%

The impact of BOPO, CAR and LDR on supply of credit can be described as follows (Table 4):
(1) C has value of t $_{statistics}$ > t $_{table}$ is 20.331 > 1,669. In addition, the sign of coefficient of C is positive. It means that C (intercept) has positive and significant impact on credit supply of state-owned banks in Indonesia.
(2) BOPO has value of t $_{statistics\ (negative\ sign)}$ < t $_{table}$ is -2.174 < 1.669. Furthermore, the sign of coefficient of BOPO is negative. It means that BOPO has negative and significant impact on credit supply of state-owned banks in Indonesia.
(3) CAR has value of t $_{statistics}$ < t $_{table}$ is 0,435633 < 1,669. The sign of coefficient of CAR is positive. However, CAR has not significant impact on credit supply of state-owned banks in Indonesia.
(4) LDR has value of t $_{statistics}$ > t $_{table}$ is 9.759 > 1.669. In addition, the sign of coefficient of LDR is positive. It means that LDR has positive and significant impact on credit supply of state-owned banks in Indonesia.

The result of F test of FEM shows that value of F $_{statistics}$ > F $_{table}$ is 75.289 > 2.75. It indicates that BOPO, CAR, and LDR have significant impact on supply of credit of state-owned banks in Indonesia in 2000-2016 simultaneously. In addition, the value of adjusted R2 is 0.869 or 86.9%. It means that dependent variable is determined by independent variables about 86.9%. In contrast, about 13.1% variables outside of the model (FEM) determine dependent variable.

3.2 Discussion

BOPO has negative and significant impact on supply of credit in state-owned banks in 2000-2016. The value of coefficient of BOPO was -0.007%. It means that if BOPO increases 1%, supply of credit will decreases 0.007%. The positive value of BOPO indicates that operational cost less than operational income. Meanwhile, the negative value of BOPO means that operational cost more than operational income.

Nuryakin and Warjiyo (2007), and Haryanto and Widyarti (2017) found that BOPO has negative and significant impact on banking credit supply. It supports to this research finding.

CAR has no significant impact on credit supply of state-owned banks in Indonesia. It means that capital can not stimulate supply of credit. The positive value of CAR shows that capital more than weighted asset. Meanwhile, the negative value of CAR describes that capital less than weighted asset.

According to Nuryakin and Warjiyo (2007), Febrianto and Muid (2013), Devi (2016), and Haryanto and Widyarti (2017) that CAR has no impact on banking credit supply. In contrast, Satria and Bagus (2010) found that CAR has positive and significant impact on banking credit supply. LDR has positive and significant impact on supply of credit in state-owned banks in 2000-2016. The value of coefficient of LDR was 0.003%. It means that if LDR increases 1%, supply of credit will increases 0.003%. The positive value of LDR explains that loan more than deposit. Meanwhile, the negative value of LDR indicates that loan less than deposit.

Khasanah and Meiranto (2015), and Amelia (2017) found that LDR has positive and significant impact on banking credit supply. However, according to Anisa and Agus (2014) in Khasanah and Meiranto (2015) that LDR has negative and significant impact on banking credit supply.

4. CONCLUSIONS

There are three variables impact on supply of credit in state-owned banks of Indonesia in 2000-2016. First, BOPO has negative and significant impact on supply of credit. Second, CAR has no significant impact on supply of credit. Finally, LDR has positive and significant impact on supply of credit.

Implication of this research covers: state-owned banks should reduce operational cost and manage level of BOPO well, state-owned banks should utilize of capital for lending properly and prudently, and state-owned banks should manage level of LDR based on guidance from Bank Indonesia and Financial Service Authority (FSA).

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