

Credit Depth on Indonesian Regional Economic Development

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Abstract

From a regional perspective, the role of banks credit is important to encourage the economic real sectors. Local government spending aimed at enhancing regional economic growth, if supported by adequate banks credit will encourage regional economic growth. Using VAR model revealed that provinces showed different responses to the causality between credit depth and regional economic growth. Panel data analysis revealed, there is a positive relationship between regional credit depth and real regional economic growth per capita, and 68 percent of real regional economic growth per capita can be explained by credit depth. Increasing credit depth by 1 basis point will increase regional economic growth by 0.03 basis points. Furthermore, increasing credit depth by 1 basis point in t-1, will reduce regional poverty by 0.16 basis points in period t. The model showed that 23 percent of the variance of poverty can be explained by credit depth in the previous year.

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INTRODUCTION

Indonesia's economic growth will be more qualified if it is supported by synchronization of monetary policy in the operational order in banking. In this case, Indonesian banks should refer their business activities in accordance with the monetary policy set by BI in such a way that the monetary policy set by BI is able to affect real sectors economy as expected through the existence of banking institutions as a monetary transmission mechanism. Banks responsiveness is a chain that makes development can be enjoyed by all people of Indonesia.

In the intermediary framework, banks credit should be well distributed regionally in order to promote nation-wide growth. However, in fact Java region is the basis of banking in Indonesia in carrying out its intermediation role. Over the past 15 years, 77 percent of banks credit has been allocated in Java. Such a sharp disparity in banks credit like this will complicate the achievement of economic growth in the region outside of Java due to the lack of financial stimulus that is able to encourage business escalation. In addition, the concentration of banking business dominated by 4 banks from 119 banks operating nationally – BRI, Mandiri, BCA and BNI– which dominate 42 percent of credit and 48 percent of funds portfolio, could have made the monetary policy responsiveness set by BI experiencing prolonged inertia.

From a regional perspective, during 2000–2013, the allocation of banks credits in Java occurred in DKI Jakarta, Jawa Timur, Jawa Barat and Jawa Tengah, while outside Java, banks credit is concentrated in Sumatera Utara, Kalimantan Timur and Sulawesi Selatan, meanwhile, the allocation of banks credit in other

provinces are still low. Such disparities in credit allocations have implications for regional development disparities.

Based on GDP, the composition of GDP in Java dominated Indonesia's real GDP in 2013 by 62 percent. This is an indication why banks are more inclined to allocate credit in the Java region, and vice versa that economic growth in the Java region can encourage banking activities to perform financial development in the form of more expansive credit allocation. In this case, there is an indication of causality between banks credit and regional economic growth and regional economic growth affecting banks credit. Furthermore, based on the productivity per population in 2000-2013 shown by real RGDP the per capita, the highest average productivity was occupied by DKI Jakarta (Rp. 37,14 million), Kepulauan Riau (Rp. 23,46 million) and Kalimantan Timur (Rp. 17,02 million), however, the allocation of banks credit in Kepulauan Riau is low.

Banks credit is believed to be the driving force to economic activity in the real sector and not limited only to debtors who receive banks financing but also to strategic partners of both vertical and horizontal debtor in such a way that through increased escalation of the business there is also an increase in labor demand that ultimately reducing unemployment and poverty. Banks credit stimulate economic by increasing business (Bernanke, 1993), and increasing labor absorption which ultimately reducing unemployment and poverty.

Furthermore, banks credit could increase transactional efficiency in such a way encourage counterparts to increase productivity which become multi-stimulus to overall economic activities (Sipahutar, Oktaviani, Siregar & Juanda, 2017; Sipahutar, 2016; Levine, 2003; Levine; Loayza & Beck; 2000; Bernanke; 1993; Pagano, 1993). Banks credit is able to increase the business scale of the debtor while increasing the business scale of the debtor business partners financed through transactional efficiency inherent in the banking system (Beck, Lundberg & Majnoni, 2006; Phase & Abma, 2003; Levine, 2003). Transmission mechanism supported by banks credit, regional economic growth becomes higher with higher sustainability as well.

Analysis of the regional economy is very important because the national economic growth is derived from the accumulation of regional economic growth. Differences in the characteristics of the regional economy have become crucial for designing regional economic policies, especially in terms of designing interconnection of inter-region economic sectors (Sipahutar, 2016, Pede, 2013; Frenken, Van Oort & Verburg, 2007; Porter, 2003). The diversity of economies in each region becomes a force for economic growth because such diversity is able to maintain economic stability.

To understand the relationship between banks credit and regional economic growth, model estimation is done using panel data. The need for panel data analysis is an aggregate validation tool for partial analysis done either through estimation of VAR/VECM model and simple regression. Analysis by panel data is more informative, more varied data, reduces the collinearity between modifiers, increases the degree of freedom, more efficient, reduces the bias that may occur when aggregation is done through individual provincial behavior and can control unobserved heterogeneity (Gujarati & Porter, 2009; Verbeek, 2004).

Rioja & Valev (2004a) used a sample of 74 countries during 1960–1995 made three classifications of the countries, (i) in countries with low credit development, there is uncertainty relationship between banks credit and economic growth, (ii) in countries with moderate levels of credit development, there is a strong positive influence between banks credit and economic growth, and (iii) in

countries with high credit development levels, although the effect of banks credit is still positive on economic growth but its influence is declining.

Despite the discrepancies between Rioja & Valev (2004a), Christopoulos & Tsionas (2004) found a uni-direction relationship between credit depth and economic growth for developing countries. Only banks credit affects economic growth, but economic growth does not cause credit deepening. However, since Christopoulos & Tsionas (2004) found no evidence of a short-run causality between credit depth and output, the relationship between economic growth and financial development at the regional level is a long-run phenomenon.

METHOD

This paper used data of Indonesian economy over the period of 2000 to 2014 from Central Bank of Indonesia (BI), described the banks credit, and from Indonesian Central Bureau of Statistics (BPS), described nominal and real Regionals GDP (RGDP), and poverty. This paper used econometrics model developed by Sipahutar, Oktaviani, Siregar & Juanda (2017), Sipahutar (2016), Sipahutar, Oktaviani, Siregar & Juanda (2016), Beck & Levine (2004); Levine, Loayza & Beck (2000) and King & Levine (1993b), which described relationship between credit depth (ratio of banks credit to nominal RGDP) and real RGDP growth per capita.

The estimation of the proposed model is that there is a bi-direction causality between banks credit and regional economic growth, that is, banks credit affects regional economic growth, and subsequently the resulting regional economic growth will influence banks to expand their credit portfolio.

Through this estimation, regional economic growth (*RGR*) in the period *t* is affected by regional credit depth (*RKE*) in period *t* and regional economic growth (*RGR*) in the period *t-n*. Furthermore, regional economic growth (*RGR*) generated in the period *t-n* will encourage and affect regional credit depth (*RKE*) in period *t*. Estimated a VAR model is formulated as:

$$RGR_{jt} = \alpha_1 + \alpha_2 RKE_{jt} + \alpha_3 \sum_{n=1}^k RGR_{j(t-n)} + \epsilon_{1t} \quad \dots \dots \dots (1)$$

$$RKE_{jt} = \beta_1 + \beta_2 \sum_{n=1}^k RGR_{j(t-n)} + \beta_3 \sum_{n=1}^k RKE_{j(t-n)} + \epsilon_{2t} \quad \dots \dots \dots (2)$$

where *RGR_{jt}* is real economic growth per capita at province *j* at time *t*; *RGR_{j(t-n)}* is real economic growth per capita at province *j* at time *t-n*; *RKE_{jt}* is credit depth (ratio of total banks credit to nominal RGDP) at province *j* at time *t*; *RKE_{j(t-n)}* is credit depth at province *j* at time *t-n*; *n* is period for *n=1,2, …,k*; α_1, β_1 is intercept, α_i, β_i are effect of independent variables to dependent variable (for *i=2,3*); and ϵ_{it} is error term for *i=1,2*.

Equations 1 and 2 show the dynamic relationship so that the two equations can be simplified by substituting equation 2 into equation 1 :

$$RGR_{jt} = \alpha_{11} + \alpha_{12} \sum_{n=1}^k RGR_{j(t-n)} + \alpha_{13} \sum_{n=1}^k RKE_{j(t-n)} + v_{1t} \quad \dots \dots (3)$$

In the same way, substitution of equation 1 to equation 2 is obtained :

$$RKE_{jt} = \alpha_{21} + \alpha_{22} \sum_{n=1}^k RGR_{j(t-n)} + \alpha_{23} \sum_{n=1}^k RKE_{j(t-n)} + v_{2t} \quad \dots (4)$$

which the matrix notation is written as :

$$RY_{jt} = \begin{bmatrix} RGR_{jt} \\ RKE_{jt} \end{bmatrix}; \quad A_0 = \begin{bmatrix} \alpha_{11} \\ \alpha_{21} \end{bmatrix}; \quad A_1 = \begin{bmatrix} \alpha_{12} & \alpha_{13} \\ \alpha_{22} & \alpha_{23} \end{bmatrix}; \quad v_t = \begin{bmatrix} v_{1t} \\ v_{2t} \end{bmatrix}$$

or can be written as :

$$RY_{jt} = A_0 + A_1 \sum_{n=1}^k RY_{j(t-n)} + v_t \quad \dots \dots \dots (5)$$

The estimation results for overall provinces in Indonesia using data in the period of 2000–2014 is summarized in Table 1.

The partial multi-equation model (VAR/VECM) estimation that used to each province explained that each province shows different responses to the causality relationship between banks credit and regional economic growth. Nevertheless, model estimation indicates that there is a bi-direction causality between banks credit and regional economic growth and that the regional economic growth will further affect banks to expand their credit portfolio.

In addition to the partial estimation of VAR/VECM model for each province in Indonesia, this study performed model estimation using panel data analysis. For model estimation with panel data, measurement of RKE_{jt} influence as independent variable to RGR_{jt} as dependent variable in each province stated as:

$$RGR_{jt} = \beta_1 + \beta_2 RKE_{jt} + \epsilon_t \quad \dots \dots \dots (6)$$

The panel data analysis (Table 2) of 33 provinces described a positive relationship between regional credit depth and real regional economic growth per capita.

Table 1. Relationship Between Credit Depth, Economic Growth, Poverty and Causality of Credit Depth and Regional Economic Growth

Provinces	Categories			Granger causality
	Credit Depth	Economic Growth	Poverty Rate	RKE-RGR
DI Aceh	Low	Fast	High	Uncertain
Sumatera Utara	High	Very Fast	Low	Uncertain
Sumatera Barat	Low	Very Fast	Low	Uncertain
Riau	Low	Very Fast	Low	Uncertain
Kepulauan Riau	High	Fast	Low	Uncertain
Jambi	Low	Very Fast	Low	RKE to RGR
Sumatera Selatan	Low	Very Fast	High	Uncertain
Bengkulu	High	Very Fast	High	RGR to RKE
Lampung	Low	Very Fast	High	RGR to RKE
Bangka Belitung	Low	Fast	Low	Uncertain
Jawa Barat	Low	Very Fast	Low	Uncertain
Banten	Low	Very Fast	Low	Uncertain
DKI Jakarta	High	Very Fast	Low	Uncertain
Jawa Tengah	Low	Very Fast	High	RGR to RKE
DI Yogyakarta	High	Very Fast	High	Uncertain
Jawa Timur	Low	Very Fast	High	RGR to RKE

Kalimantan Selatan	High	Very Fast	Low	RGR to RKE
Kalimantan Timur	Low	Very Fast	Low	Uncertain
Kalimantan Barat	Low	Very Fast	Low	Uncertain
Kalimantan Tengah	Low	Very Fast	Low	Uncertain
Sulawesi Utara	High	Very Fast	Low	Uncertain
Gorontalo	High	Very Fast	High	Uncertain
Sulawesi Tengah	Low	Very Fast	High	Uncertain
Sulawesi Selatan	High	Very Fast	Low	RKE to RGR
Sulawesi Barat	High	Very Fast	Low	Uncertain
Sulawesi Tenggara	Low	Very Fast	High	Uncertain
Bali	High	Very Fast	Low	RGR to RKE
Nusa Tenggara Barat	Low	Fast	High	Uncertain
Nusa Tenggara Timur	High	Fast	High	RKE to RGR
Maluku	High	Fast	High	RKE to RGR
Maluku Utara	High	Fast	Low	RGR to RKE
Papua	Low	Very Low	High	Uncertain
Papua Barat	Low	Very Fast	High	Uncertain

Source: Author (2018)

The model estimation showed that 68 percent of the variance of real regional economic growth per capita can be explained by credit depth. Increasing banks credit portfolio by 1 basis point will increase regional economic growth by 0.03 basis points significantly. Indonesian economic development has to be well distributed across the regions so that the resulting of Indonesian economic growth can improve social welfare in each province. An indicator of social welfare regionally is proxied by the poverty rate. The estimation model is that banks credit promotes economic growth through increasing real sectors and reduce poverty through increasing labor demanded.

Table 2. Fixed Effect Model on the Relationship of Regional Credit Depth (*RKE*) and Real RGDP Growth per Capita (*RGR*)

Dependent Variable: <i>RGR</i>				
Method: Panel EGLS (Cross-section weights)				
Sample (adjusted): 2008 2014; Periods included: 7				
Cross-sections included: 33				
Total panel (balanced) observations: 231;				
Linear estimation after one-step weighting matrix				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
<i>RKE</i>	0.028100	0.007103	3.955869	0.0001
<i>RGR</i> ₋₁	-0.000422	0.072686	-0.005809	0.9954
C	3.586768	0.346452	10.35286	0.0000

Source: Author (2018)

Through the transmission mechanism between banks credit to regional economic growth and reduce poverty, the model estimate that regional poverty (*RPOV*) in period *t* are influenced by the credit depth (*RKE*) in period *t-1*. The regression model using panel data formulated as :

$$RPOV_{jt} = \gamma_1 + \gamma_2 RKE_{j(t-1)} + \mu_{jt} \quad \dots \dots \dots (7)$$

where $RPOV_{jt}$ is poverty rate at province j at time t ; $RKE_{j(t-1)}$ is credit depth at province j at time $t-1$; γ_1 is intercept; γ_2 is the effect of the dependent variable to independent variable, and μ_{jt} is error term.

Table 3. Random Effect Model on the Relationship of Regional Credit Depth (RKE) and Regional Poverty Rate ($RPOV$)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
$RCRE_{-1}$	-0.158606	0.019349	-8.197179	0.0000
C	17.99432	1.364173	13.19064	0.0000

Source: Author (2018)

Using regional credit depth (RKE) and regional poverty rate ($RPOV$) in period of 2008–2014, Table 3 showed that there is a negative relationship between credit depth and regional poverty. Increasing credit depth by 1 basis point in $t-1$, will significantly reduce the regional poverty rate by 0.16 basis points in period t . By 23 percent of the variance of poverty can be explained by the credit depth significantly in the previous period.

RESULTS AND DISCUSSION

Today, the Republic of Indonesia consists of 34 provinces which expanded from 27 provinces in the New Order regime after the enactment of regional autonomy policy in 1998. One of 27 provinces –Timor Leste– separated from Indonesia in 1999, and 8 new provinces –Kepulauan Riau, Bangka Belitung, Banten, Gorontalo, Sulawesi Barat, Maluku Utara, Papua Barat, and Kalimantan Utara– are split off from its parent province. In this study, the provinces analyzed were 33 provinces, excluding the recently expanded –Kalimantan Utara Province– due to the lack of data about credit depth and regional economic growth.

Some of the provinces that are the result of split off from their parent provinces such as Kepulauan Riau, Banten, Sulawesi Barat, and Papua Barat are analyzed by simple regression model due to limited time-series data, while Bangka Belitung, Gorontalo and Maluku Utara are still possible to be modeled with multi-equation time-series. Provinces that do not qualify for modeling, both multi-equation and simple regression are Kalimantan Barat and Sulawesi Tengah because time-series data for economic growth and banks credit in both provinces is not stationary, thus, the analyzing of that two provinces refer to panel data analysis.

There is a positive relationship between banks credit and regional economic growth. This is because banks are able to enter all lines of economy ranging from the scale of consumers, small and medium enterprises, until the corporate scale (Arestis, Demetriades & Luintel, 2001). A 68 percent estimation of regional economic growth models can be explained by banks credit. Regional banks credit is one of the stimulators of economic growth as occurs on a nation-wide (Aghion, Angeletos, Banerjee & Manova, 2010; Woodford, 2010; Beck, Demircuc-Kunt, Laeven & Levine, 2008; Beck, Lundberg & Majnoni, 2006; Porter, 2003; Bernanke & Gertler, 1999; Bernanke, 1993; King & Levine, 1993b).

Regionally, there is a causality between banks credit and regional economic growth. This is also in line with nation-wide or aggregate model estimation (Sipahutar, Oktaviani, Siregar & Juanda, 2016). Thus, the economic growth taking place has an important role for banks to expand their intermediation role on financial development (Bassetto, Cagetti & De Nardi, 2015; Beck & Levine, 2004; Rioja & Valev, 2004b; Porter, 2003; Pagano, 1993; Bencivenga & Smith, 1991; Goldfeld & Chandler, 1986).

Indonesia's economic growth nation-wide is an aggregate of economic growth that occurs in each province. Based on causality on a VAR model estimation at the nation-wide, changes in Indonesia's economic growth in the current period were significantly stimulated by positive changes from banks credit in the previous period. Similarly, credit changes in the current period were significantly stimulated by positive changes in the previous period (Sipahutar, 2016; Sipahutar, Oktaviani, Siregar & Juanda, 2016). Although estimation of nation-wide VAR models does not occur entirely in the partial estimation of VAR models at the provincial level, the positive relationship between credit depth to real RGDP growth per capita can be explained by panel data analysis. Thus, banks credit at the regional level acts as a regional growth accelerator in regional development and economy.

Similarly to the causality described by Granger causality, banks credit significantly affects regional economic growth and subsequently, regional economic growth affects regional credit depth. Although the causality described by Granger causality does not occur partially in each province, but because Granger causality obtained nation-wide is the aggregation of the causality of each province in Indonesia, the banks credit and regional economic growth is Granger causality (Sipahutar, Oktaviani, Siregar & Juanda, 2016). Although there is a positive relationship between banks credit to economic growth the impact of the credit allocation is strongly influenced by the economic situation in each province (Pede, 2013; Frenken, Van Oort & Verburg, 2007; Rioja & Valev, 2004a; Porter, 2003).

Rioja & Valev (2004a) used a sample of 74 countries during the period 1960–1995 made three classifications of countries in relation to credit depth and economic growth, (i) countries with low credit depth, there is uncertainty relationship between credit depth and economic growth, (ii) countries with moderate level of credit depth, there is a strong positive influence between credit depth and economic growth, and (iii) countries with high credit depth, the effect of credit depth is still positive but declining on economic growth. Based on Rioja and Valev criteria, because Indonesian average credit depth during 2001–2014 was 22.9 percent, it is low credit depth if the average of $RKE < 22.9$ percent and high credit depth if average $RKE > 22.9$ percent.

King & Levine (1993a) classified the real economic growth rate per capita (GYP) that were, (i) economic growth is very fast if [$GYP > 3$ percent], (ii) rapid economic growth if [$2 \text{ percent} < GYP < 3 \text{ percent}$], (iii) economic growth is slow if [$0.5 \text{ percent} < GYP < 2 \text{ percent}$], and (iv) economic growth is very slow if [$GYP < 0.5 \text{ percent}$]. Using King and Levine criteria and Rioja and Valec criteria, then each province can be mapped based on credit depth, real economic growth per capita, and Granger causality (Figure 1).

In general, Indonesian regional economic growth met very fast growth categories (King & Levine, 1993a), however, under the category of credit depth is in a low category. This is in line with the FEM estimation which explained that banks credit contribution is only 3 percent on regional economic growth. Meanwhile, in the nation-wide economic growth which is an aggregate of regional economic growth, the most important source for the variance of economic growth is economic growth itself (Sipahutar, 2016; Sipahutar, Oktaviani, Siregar & Juanda, 2016).

Banks credit contributed about 6.5 per cent to the variance of Indonesian economic growth, or in other words, banks credit is the source of economic growth, both nation-wide and regionally (Aghion, Angeletos, Banerjee & Manova, 2010; Woodford, 2010; Beck, Demirguc- Kunt, Laeven & Levine, 2008; Beck, Lundberg & Majnoni, 2006; Bernanke & Gertler, 1999; Bernanke, 1993; King & Levine, 1993b).

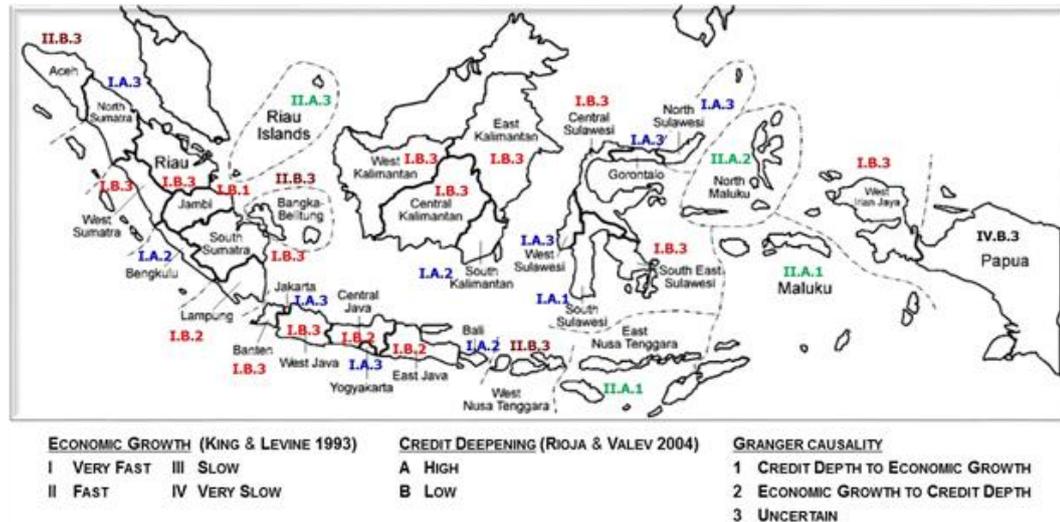


Figure 1. Indonesian Economic Map Based on Economic Growth, Credit Depth, and Granger Causality

Furthermore, for banks credit, although the contribution of economic growth in the first year is relatively small since the second year, both the contribution of economic growth and banks credit has a balanced composition of 48 percent and 52 percent (Sipahutar, 2016; Sipahutar, Oktaviani, Siregar & Juanda, 2016). In this case, both economic growth and banks credit itself is a source for the variance of banks credit, both nation-wide and regionally. Thus, the economic growth played an important role for banks to expand their intermediation activities in the form of credit depth (Bassetto, Cagetti & De Nardi, 2015; Beck & Levine, 2004; Rioja & Valev, 2004b; Pagano, 1993; Bencivenga & Smith, 1991; Goldfeld & Chandler, 1986).

Based on the partial estimation of VAR models in each province, there are several provinces that have a significant causality where banks credit affecting economic growth and vice versa, that economic growth significantly affects banks credit. Nevertheless, there is uncertainty over the causality between banks credit and economic growth in the province, both in low or high credit depth categories. Therefore, the VAR model estimation explained that the factor of high-low credit depth is not related to the direction of causality. The uncertainty of the causality in the estimation of this model does not mean that there is no effect of banks credit on economic growth and there is no effect of economic growth on banks credit. The estimation of this model should be interpreted that there is still a bi-direction causality between banks credit to economic growth, as well as the influence of economic growth on banks credit since nation-wide (which is an aggregate of regional performance) there is a causality between both variables. The uncertainty of the causality that occurs is a signal that neither banks credit nor regional economic growth is strong enough to produce causality (Sipahutar, 2016). Higher banks credit is required to promote economic growth, and on the contrary, higher economic growth is needed to encourage banks credit.

This interpretation is in line with FEM model estimates using a panel of data explaining that 1 basis point increase in banks credit will increase regional economic growth by 0.03 basis points. Similarly, this interpretation is in line with the VAR/VECM model estimation that 6.5 percent of the variance of national economic growth originates from banks credit as the source of economic growth in such a way that banks credit acts as a growth accelerator for regional economic growth.

Based on the expansiveness of regional banks credit represented by credit depth, 14 provinces are in the category of high credit depth and 19 provinces in the category of low credit depth. Furthermore, although 77 per cent of banks credit portfolio during the period of 2000–2014 is allocated in Java, only DKI Jakarta and DI Yogyakarta provinces are in the category of high credit depth. In both provinces, although high credit depth is accompanied by rapid economic growth there is uncertain causality between credit depth and economic growth.

For the provinces resulting by expanded from their parent provinces, high credit depth occurred in Kepulauan Riau, Gorontalo, Sulawesi Barat, and Maluku Utara, meanwhile there were low credit depth occurred in Bangka Belitung, Banten and Papua Barat, –there were uncertainty of causality between credit depth and economic growth in the expanded province, except in Maluku Utara– there was a one-way causality from economic growth to credit depth. The category of credit depth in the province resulting from expanded was generally the same as their parent province except for Kepulauan Riau which is in the category of high credit depth while Riau Province as its parent province is in the category of low credit depth.

Based on regional perspectives and linked to nation-wide perspectives where there is a causality between credit depth and economic growth, as well as the panel data analysis that explained a positive effect of banks credit on regional economic growth, the VAR model estimation partially in each province, are interpreted as, (i) for provinces which found a uni-direction causality between credit depth and economic growth, fiscal policy is needed that leads to increased local government spending to increase economic growth and ultimately increase credit depth, (ii) for provinces which found a uni-direction causality between economic growth and credit depth, a more expansive banking policy is needed to allocate credit to the real sectors to increase economic growth, inline with local government capital expenditures, (iii) for provinces which found uncertain causality between credit depth and economic growth, simultaneously fiscal policies –to increase local government spending– and more expansive banking policies to allocate credit to the real sectors.

Economic growth plays an important role for banks to expand their intermediary role in the form of financial development (Sipahutar, Oktaviani, Siregar & Juanda, 2017; Bassetto, Cagetti & De Nardi, 2015; Rioja & Valev, 2004b; Bencivenga & Smith, 1991). Economic growth supported by the role of banks credit can be explained clearly from the effect of banks credit in increasing the absorption of labor resulting from increase of the size of businesses in real sectors. Banks as a credit transmission channel affects the real sector directly through financing investment and working capital to increase output (Bernanke & Gertler, 1999; Bernanke, 1993; Goldfeld & Chandler, 1986). Increasing output in the real sectors can be achieved because banks credit are transformed into capital and current assets, which increase in the capital and current assets require an increase in labor.

As explained in the banks credit relation to the unemployment rate, there is a negative relationship between credit depth to unemployment rate nation-wide (Sipahutar, 2016; Sipahutar, Oktaviani, Siregar & Juanda, 2016). Estimated models

obtained nation-wide represented a negative relationship between credit depth and unemployment regionally. Based on poverty data nation-wide and regionally, the national average poverty rate is 15.73 percent. Referring to that averages, if the province has an average poverty rate < 15.73 percent is categorized as a province with low poverty rates and high poverty rates if the poverty rate > 15.73 percent (Sipahutar, 2016). The model estimation summarized (Table 3) explained that the uncertainty of the relationship between credit depth, regional economic growth, and poverty also occurs in each province. Several provinces with high credit depth and rapid economic growth are in the category of high poverty rates. However, because based on model estimation with panel data analysis, both nation-wide and by region, explained that poverty rate will decrease if credit depth increase in the previous period, hence Table 3 becomes a signal that credit depth and regional economic growth are not strong enough to reduce poverty. The implication is, it needs higher credit depth and higher economic growth, especially in provinces with high poverty category.

Banks credit is a stimulator for achieving social welfare through its role by reducing poverty. However, as a growth accelerator, the significance of banks credit to regional poverty reduction is an integral part of provincial government spending on infrastructure, capital spending and other government programs aimed to reduce the burden of the poor such as social assistance, health, and other subsidies directly or indirectly. This can be interpreted that for a regional development planning process that directing credit depth to a stronger level, the role of banks credit to promote higher regional economic growth and subsequently be able to reduce poverty consistently are a sufficient condition.

Banks credit to regional economic growth is a vital element for the development process at the provincial level. Its role as a growth accelerator factor will broaden the meaningfulness of economic growth through increased the size of the business in the real sectors. Economic growth accelerated by banks credit is able to encourage economic growth in each province to be more qualified because it produces higher prosperity. Better quality of social life is reflected in the ability of banks credit to reduce unemployment and poverty in every province.

Based on regional perspective, and linked to national perspective where there is a causality between credit depth and economic growth, as well as panel data analysis that explained the positive effect of credit depth on poverty reduction, regional development process needs to pay close attention, (i) for regions of high credit depth, very fast economic growth and low poverty rates, it is necessary to support mutually on banking and fiscal policies so that economic and credit depth growth will sustain improving welfare, (ii) for regions of high credit depth, very fast economic growth but high poverty rates, it is necessary that banking policy-oriented is on investment credit to the leading economic sectors in the region, (iii) for the region of low credit depth, very fast economic growth and the poverty rate is low, it is necessary that local governments implementing the development of region-based banking so that banks tend to grow and ultimately can maintain a low level of poverty.

To maintain the sustainability of banks within the framework of monetary transmission channel mechanism -in addition to maintaining the quality of banking performance through bank performance indicators- the role of local government is required to determine banking sector as a growth accelerator through the regional banking-based development planning process. The conformity between local government spending and the direction of banks business in each province needs to be integrated. The integration of banks credit in the regional development planning process will encourage higher regional economic growth, then by a high regional

economic growth, banks will play a higher role in every aspect of regional financing by higher levels of financial development as well.

CONCLUSION

Credit depth plays a significant role in regional development. Credit depth also has implications for regional poverty reduction. The transmission mechanism from credit depth to poverty reduction is through increasing the scale of business in the real sector as a result of credit expansion. Financing the economic real sectors can increase capital and cash flow, the increased labor demanded, reduce unemployment and ultimately reduce the level of poverty. Given the important role of banks in regional business financing, the role of BPDs should be strengthened as one of the sources of regional economic growth. Together with regional fiscal policies, BPDs business policies that integrated with regional development planning will be able to promote a higher quality of development.

REFERENCES

- Aghion, P., Angeletos, G.M., Banerjee, A., & Manova, K. (2010). Volatility and Growth: Credit Constraints and the Composition of Investment. *Journal of Monetary Economics*, 57, 246–265.
- Arestis, P., Demetriades, P.O., & Luintel, K.B. (2001). Financial Development and Economic Growth: The Role of Stock Market. *Journal of Money, Credit and Banking*, 33(1), 16–41.
- Bassetto, M., Cagetti, M., & De-Nardi, M. (2015). Credit Crunches and Credit Allocation in a Model of Entrepreneurship. *Review of Economic Dynamics*, 18, 53–76.
- Beck, T., Demirguc-Kunt, A., Laeven, L., & Levine, R. (2008). Finance, Firm Size and Growth. *Journal of Money, Credit and Banking*, 40(7), 1279–1405.
- Beck, T., Lundberg, M., & Majnoni, G. (2006). Financial Intermediary Development and Growth Volatility: Do Intermediaries Dampen or Magnify Shocks? *Journal of International Money and Finance*, 25, 1146–1167.
- Beck, T., & Levine, R. (2004). Stock Market, Banks and Growth: Panel Evidence. *Journal of Banking and Finance*, 28, 423–442.
- Bencivenga, V.R., & Smith, B.D. (1991). Financial Intermediation and Endogenous Growth. *Review of Economic Studies*, 58(2), 195–209.
- Bernanke, B.S. (1993). Credit in the Macroeconomy. *Federal Reserve Bank of New York Quarterly Review*, 18(1), 50–70.
- Bernanke, B. S., & Gertler, M. (1999). Monetary Policy and Asset Price Volatility. *Federal Reserve Bank of Kansas City Economic Review*, Fourth Quarter, 1–36.
- Christopoulos, D. K., & Tsionas, E. G. (2004). Financial Development and Economic Growth: Evidence from Panel Unit Root and Cointegration Tests. *Journal of Development Economics*, 73, 55–74.
- Fase, M. M. G., & Abma, R. C. N. (2003). Financial Environment and Economic Growth in Selected Asian Countries. *Journal of Asian Economics*, 14, 11–21.
- Frenken, K., Van Oort, F., & Verburg, T. (2007). Related Variety, Unrelated Variety and Regional Economic Growth. *Regional Studies*, 41(5), 685–697.
- Goldfeld, S. M., & Chandler, L. V. (1986). *The Economics of Money and Banking (ninth edition)*. United States: Harper and Row.
- Gujarati, D. N., & Porter, D. C. (2009). *Basic Econometrics (fifth edition)*. New York: McGraw-Hill.
- King, R.G., & Levine, R. (1993a). Finance, Entrepreneurship and Growth – Theory and Evidence. *Journal of Monetary Economics*, 32, 513–542.

- King, R. G., & Levine, R. (1993b). Finance and Growth: Schumpeter Might be Right. *Quarterly Journal of Economics*, 108(3), 717-737.
- Levine, R. (2003). More on Finance and Growth: More Finance, More Growth? *Federal Reserve Bank of St. Louis*, July/August.
- Levine, R., Loayza, N., & Beck, T. (2000). Financial Intermediation and Growth: Causality and Causes. *Journal of Monetary Economics*, 46, 31-77.
- Pagano, M. (1993). Financial Markets and Growth - An Overview. *European Economic Review*, 37, 613-622.
- Pede, V.O. (2013). Diversity and Regional Economic Growth: Evidence from US Counties. *Journal of Economic Development*, 38(3), 111-127.
- Porter, M.E. (2003). The Economic Performance of Regions. *Regional Studies*, 37 (6&7), 549-578.
- Rioja, F., & Valev, N. (2004a). Finance and the Sources of Growth at Various Stages of Economic Development. *Economic Inquiry*, 42(1), 127-140.
- Rioja, F., & Valev, N. (2004b). Does One Size Fit All? A Reexamination of the Finance and Growth Relationship. *Journal of Development Economics*, 74, 429-447.
- Sipahutar, M.A. (2018). Determination of Monetary Transmission through the Types of Credit on Economic Growth. *Quantitative Economics Research*, 1(1), 13-24.
- Sipahutar, M. A., Oktaviani, R., Siregar, H., & Juanda, B. (2017). Linkage of Credit on BI Rate, Funds Rate, Inflation and Government Spending on Capital. *Journal of Economics and Policy*, 10(1), 1-11.
- Sipahutar, M. A. (2016). Keterkaitan Kredit dan Kelembagaan Perbankan Indonesia pada Perekonomian Nasional dan Regional [*Linkage of Indonesian Banks Credit and Institutional on National and Regional Economy*]. (Unpublished Dissertation). Sekolah Pascasarjana Institut Pertanian Bogor, Indonesia.
- Sipahutar, M. A., Oktaviani, R., Siregar, H., & Juanda, B. (2016). Effect of Credit on Economic Growth, Unemployment and Poverty. *Jurnal Ekonomi Pembangunan*, 17(1), 37-49.
- Verbeek, M. (2004). *A Guide to Modern Econometrics (second edition)*. London: John Wiley & Sons.
- Woodford, M. (2010). Financial Intermediation and Macroeconomic Analysis. *Journal of Economic Perspectives*, 24(1), 21-44.