

Bank Liquidity and Economic Development in Underdeveloped Regions: An Empirical Study in Indonesia*

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Received: March 20, 2021 Revised: May 22, 2021 Accepted: June 01, 2021

Abstract

This study aims to determine the relation between the real sector and the financial sector in underdeveloped areas in Nusa Tenggara, Indonesia. To facilitate understanding of these linkages, researchers use the logic of credit channel mechanism of monetary policy, financial intermediation, as well as supply leading and demand following theories. The research variables include economic growth, inflation, liquidity, and NPL at the provincial level, with a data sample from 2008 to 2019. This research uses VAR/VECM as the analysis tools. The findings of the long-term analysis in East Nusa Tenggara show there is a phenomenon of cost-push inflation as well as the negative relation between inflation and economic growth. The impact of liquidity on inflation is positive, while the impact of economic growth on inflation is negative. Meanwhile, in West Nusa Tenggara, the impact of economic growth on inflation is positive. On the other hand, the impact of liquidity and NPL on inflation and economic growth is negative. In conclusion, generally, the economy in West Nusa Tenggara is better than the East Nusa Tenggara. The key to improving the economy of Nusa Tenggara is by improving its liquidity. This can be done by increasing the volume of public savings to increase bank credit capacity.

Keywords: Regional Economic Growth, Liquidity, Inflation, NPL, Credit Capacity

JEL Classification Code: E44, E61, F63, G28, G32

1. Introduction

Presidential Regulation Number 131/2015 regarding the determination of underdeveloped areas for 2015–2019 states that there are still 122 underdeveloped areas in Indonesia, which define as regencies whose territory and society are less developed compared to other regions. Furthermore, the status of underdeveloped areas is determined based on the criteria of the community's economy; human resources; facilities and infrastructure; regional financial capacity; accessibility; and regional characteristics on a national scale. Among those areas, there are 2 provinces in Nusa Tenggara region in Indonesia, namely WNT (West Nusa Tenggara) and ENT (East Nusa Tenggara). WNT province consists of 10 districts, in which 8 districts are still in the underdeveloped category, such as West Lombok, Central Lombok, East Lombok, Sumbawa, Dompu, Bima, West Sumbawa, and North Lombok. On the other hand, ENT province comprise of 22 districts, in which 18 are still lagging behind, such as West Sumba, East Sumba, Kupang, Central South Timor, Central North Timor, Belu, Alor, Lembata, Ende, Manggarai,

*Acknowledgements:

This work was supported by the Ministry of Research and Technology of the Republic of Indonesia and Esa Unggul University.

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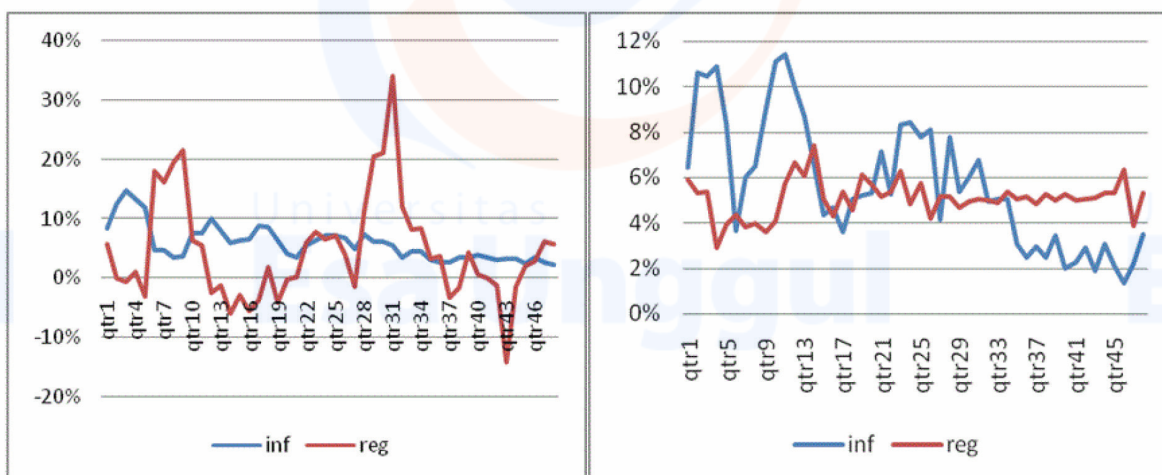


Figure 1: Development of REG and INF in WNT (left) and ENT (right)

Rote Ndao, West Manggarai, Central Sumba, Southwest Sumba, Nagekeo, East Manggarai, Sabu Raijua, and Malaka.

Figure 1 shows information regarding the output market conditions proxied by REG (regional economic growth -YoY) and INF (inflation -YoY) in WNT and ENT based on data for 2008–2019 (quarterly) obtained from the Central Bureau of Statistics of Indonesia. It can be seen that the development of INF in ENT is more stable than that of WNT, especially in the 34–48 quarter. However, when viewed from the REG development, it appears that WNT province is more stable, with an average REG of 4.553%, and a minimum of -14.125% and a maximum of 34.075% , along with SD (Standard of Deviation) of 8.915% . Moreover, from the INF development, it has different trends with an average of 5.693% , with a minimum of 2.150% and a maximum of 14.740% along with an SD of 3.007% . In general, it can be seen that the rate of REG is lower than the rate of INF, yet there are several periods where REG is higher than INF such as in the 5th – 11th quarter, 22nd – 23rd quarter, 28th – 35th quarter, and 47th – 48th quarter. Meanwhile, in ENT province (in the same period) the rate of REG is mostly positive with an average REG of 5.085% , and a minimum of 2.900% and a maximum of 7.418% along with an SD of 0.826% . The average INF is 5.699% , with a minimum of 1.350% and a maximum of 11.420% along with an SD of 2.825% . In general, the rate of REG is lower than the rate of INF, while REG is lower than INF in the 6th, 14th, 15th, 17th, 19th, 27th, and 34th – 48th quarters. Additional information (from the same source of data) for the 2017–2019 annual data shows that the contribution of the GDPR (*Gross Domestic Product Regional*) to the GDPN (*Gross Domestic Product National*) appears to be very little. In 2017, the contribution of WNT provincial GDP was 0.947% , in 2018 was 0.857% and in 2019 was 0.848% . Meanwhile, the contribution of

ENT provincial GDP during 2017, 2018, and 2019 were only 0.628% , 0.626% , and 0.627% of the GDPN.

Banking sector data (Regional Economic and Financial Statistics) shows that in WNT and ENT, the proportion of credit (*loan*) appears to be small on a national scale, and LDR (*Loan to Deposits Ratio*) is more than 100% which shows that public savings (deposits) are still insufficient to support local bank credit. In WNT, the amount of LDR in 2017 was 135.10% , with a total credit of IDR 34,991.83 billion, where the proportion of this credit was only 0.735% of the total national credit; LDR in 2018 was 170.37% , with a total credit of IDR 49,149.49 billion, where the proportion was 0.924% ; and LDR in 2019 was 188.30% , with a total credit of IDR 58,856.28 billion, where the proportion was 1.045% . Thus, the efficiency of this LDR is fairly high, thereby exceeding the banking liquidity health threshold. Banking conditions at ENT show that LDR in 2017 was 115.52% , with a total credit of IDR 26,993.78 billion, with the proportion of only 0.567% of the total national credit; LDR in 2018 was 121.30% , with a total credit of IDR 30,643.38 billion, where the proportion was 0.576% ; and LDR in 2019 was 114.41% with a total credit of IDR 34,099.06 billion, where the proportion was 0.605% . Hence, the LDR coefficient in ENT and WNT was excessively high when compared to LDR (nationally), which only reached 92.624% in 2017, 97.522% in 2018, and 97.045% in 2019. This phenomenon raises the question of why are WNT and ENT provinces lagging in economic conditions and how is the performance of the banking sector supporting real sector growth since the economic development of the region should be closely related to its financial sector.

In addition, the relation between the real sector and the financial sector in the economy is described in the circular flow of the economy in macroeconomics theory (Mankiw, 2019).

As a result, the financial market is considered to be a derivation of the output market, and the financial market is managed to support economic development. Todaro and Smith (2015) stated that the REG growth of a region is strongly supported by the domestic saving and investment indicators which are used to determine the REG growth and economic development targets. It is consistent with what Mishkin (2016) had stated that the main function of financial intermediation in the banking sector is an important activity in supporting the economy. This action makes the flow of funds from the SIU (*Surplus Income Unit*) to the DIU (*Deficit Income Unit*). Furthermore, this financial intermediation process will encourage the economy to be more efficient and dynamic. Bahadir and Gumus (2016) and Avdjiev and Zeng (2014) also explained that the development of the financial sector which is marked by an increase in economic growth will be able to accelerate economic growth.

In Indonesia, Ascarya (2012) proved that the conventional policy rate is transmitted to output and inflation. In addition, the shock of conventional interest rate, credit, and interbank rate give negative and permanent impacts on inflation and output, except for the certificate of Bank Indonesia with a positive impact on inflation though it negatively affects the output. Subsequently, Mandala (2020) concluded that in Indonesia, the relation between inflation and REG growth is negative, while the relation between government expenditure and economic growth is positive, and the effect of routine expenditure is not significant. Moreover, Bibi and Rashid (2014) focused on empirical analysis to find out the role of trade openness, inflation, imports, exports, real exchange rate, and foreign direct investment in enhancing economic growth in Pakistan. The results indicated a long-run relationship among the variables. However, the negative impact of trade openness can be overcome by producing import substitutes and creating conditions for trade surplus. Furthermore, foreign direct investment and trade are considered vital elements that improve the influence of economic growth.

Bist (2018) investigated the long-run relationship between financial development and economic growth using panel unit root and panel cointegration analysis in 16 selected low-income countries for the period of 20 years from 1995 to 2014. The results showed that there exists a cross-sectional dependence across the countries. Pedroni's panel cointegration analysis provided clear support for the hypothesis that there exists a long-run cointegrating relationship between financial development and economic growth. The long-run panel estimates indicate that financial development has a positive and significant impact on economic growth. The results also showed the positive impact of financial development on economic growth in the majority of the countries. Likewise, it is found that the flow of credit to the private sector is very low in this region of the world. Thus, one of the important

policy implications of the findings of this study is that the policymakers should give more emphasis on the policies that provide a favorable environment for the private sector to grow.

Huljak et al. (2020) in their research stated that elevated NPL ratios remain an important problem in several euro area countries. Moreover, the COVID-19 pandemic is likely to trigger a significant increase in NPLs across the euro area. Their policy note examined the interlinkages and feedback loops between NPLs, bank credit, and the real economy, using a panel Bayesian VAR model. We find that an exogenous increase in the change in NPL ratios depresses bank lending, widens lending spreads, and leads to a fall in real GDP growth and residential real estate prices. Conditional forecast analysis provided additional evidence that a decline in NPL ratios results in significant economic and financial benefits for euro area countries. Overall, the results provided additional evidence for the economic merits associated with effective policy measures to speed up the resolution of NPLs. Given the expected COVID-19 induced surge in NPLs, the economic argument in favor of such policies is stronger than ever before.

From the explanation of the research results above, it can be seen that there are pros and cons to the results of the research findings, in which there is a disparity. Such research gap motivates to know the truth regarding the condition of the provinces in WNT and ENT, especially regarding how interactive the performance of the financial sector is with the real sector in Nusa Tenggara. The phenomenon and the results of a comparative study from previous research gave the inspiration to carry out this research, where the focus is directed to ascertain how the real sector performance interacts with the performance of the banking sector in WNT and ENT provinces. Specifically, the purpose of this study is to answer research questions concerning 1) the relation between INF-REG (*Inflation - Regional Economic Growth*); 2) the impact of liquidity or LDR (loan to deposits ratio) and NPL on INF and RE; 3) responses of INF to REG, LDR and NPL and 4) response of REG to INF, LDR, and NPL.

2. Literature Review

2.1. Relation Between Inflation and REG

Satria (2012) based on quarterly data of 1981–2006 showed that there is a long-run relationship between inflation and economic growth, which has been recognized by macroeconomists in the last three decades. For developing countries, inflation effect on economic growth is more supply-side phenomena than demand-side or economic fluctuation. On the other hand, a stable and low inflation rate, in the long run, will promote higher output growth. They found the significance of two-way causality between inflation and growth in Indonesia. The result had also shown

a non-linear causality relationship from inflation to economic growth using Indonesian annual data from 1981 to 2010. The data reveals there is a long-run non-linear relationship between inflation and growth. This finding contradicts the research of Supartoyo et al. (2013) based on regional panel data for 2006–2010 which showed that the effect of inflation on economic growth is insignificant. Meanwhile, Dinh (2020) and Mandala (2020) used time-series data with VAR/VECM analysis that showed a positive correlation between economic growth and inflation.

On the other hand, international researchers such as Sriyalatha and Torii (2019) and Eggoh and Khan (2014) showed a non-linear relation between inflation and economic growth. They also found that the non-linearity is sensitive to the country's level of government expenditures, financial development, and capital accumulation. Hung and Cothren (2016) developed a simple endogenous growth model and results demonstrated that increased government expenditure led to a higher inflation rate and increased economic growth for countries with high initial inflation rates.

2.2. Relation Between Bank Liquidity and REG

The financial cycle that is formed from credit and its impact on the economy can be explained through the theory of financial development and economic growth. The development of financial services is a response to public demand in an economy known as the demand following hypothesis (Behera, 2021; Jumono et al., 2020; Levine & Zervos, 1998; Dritsaki & Bargiota, 2005). Meanwhile, the financial sector precedes and encourages real sector growth which is referred to as the *supply leading hypothesis* (Jumono et al., 2021; Monsura & Vilaruz, 2021; Levine & Zervos, 1998; Dritsaki & Bargiota, 2005). Bernanke and Blinder (1988) stated that most economists argue that banks or financial intermediary institutions in the economy are believed to play a very important role in transmitting monetary policy. Initially, the role of banks in the transmission of monetary policy was believed to be through the money channel or the obligations of the banking sector to the economy (money view). Subsequently, the developed idea shows that banks influenced the economy through the credit channel. Camba and Camba (2020) and Bernanke and Gertler (1995) believed that monetary policy for the economy can be done through bank lending channels and through balance sheet channels where monetary policy affects the ability of companies to obtain external sources of financing from banks.

2.3. Relation Between Bank Liquidity and Inflation

Taylor and Zilberman (2016) stated that macroprudential policies are effective in promoting price stability through

financial friction. According to him, financial regulations can perform better to achieve price stability (Rosoiu, 2015). Hence, the macroprudential policy through financial friction with the determination of the LDR (*Loan to Deposit Ratio*) is effective in influencing inflation, since LDR in Indonesia is one of the macroprudential policy instruments in overcoming liquidity problems to achieve financial stability. It is based on the fact that price stability will not be achieved without a stable financial system in the economy. Other research by Seprillina et al. (2016) showed that the LDR instrument has an effective response to the inflation rate in Indonesia. A macroprudential policy with the LDR instrument has a significant positive effect on inflation. The LDR contribution has succeeded in minimizing credit risk in banking, which in turn has stabilized the price level. Meanwhile, Sipahutar et al. (2017) stated that the relation between credit depth and inflation rate in Indonesia is considered to be bidirectional.

2.4. Relation Between NPL and REG

Nkusu (2011) explains the relation between NPL and REG in the IRFs (*Impulse Response Functions*) analysis and finds that an increase in inflation by 2.7 percentage points adverse shock to GDP growth that causes NPL to increase by 0.4 percentage point in the first year and then reaching 1.7 by the fourth year. The IRFs attribute to NPL is considered to be a central role in the linkages between credit market frictions and macro-financial vulnerability. Experts suggest that a sharp increase in NPL triggers long-lived tailwinds that cripple macroeconomic performance from several fronts. Furthermore, Accornero et al. (2017) in Italy, stated that economic development has an impact on NPL and vice versa. Meanwhile, Huljak et al. (2020) found that an increase in changes in the NPL ratio depressed bank lending, widened the spread of lending, and led to a fall in real-output GDP growth and housing real estate prices. Their analysis proves that a reduction in the NPL ratio generates significant economic and financial benefits for the countries of the Euro area.

2.5. Relation Between NPL and Inflation

Nkusu (2011) in the 26 advanced economies, found a relation between NPL and inflation. An increase in inflation by 1.6 percentage points causes NPL to increase by 0.3 percentage points in the first year and a cumulative 1.6 percentage points by the fourth year. The economies considered were Australia, Austria, Belgium, Canada, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Israel, Italy, Japan, Korea, Luxembourg, the Netherlands, New Zealand, Norway, Portugal, Singapore, Spain, Sweden, Switzerland, the United Kingdom, and the United States. On the other perspective, Klein (2013) looked

at the impact of shocks on NPL, stating that increasing NPL had a significant negative impact on credit, inflation, and real GDP growth, as well as contributed to an increase in unemployment. In this case, an increase in NPL by one percentage point results in a cumulative decrease of 1.7 percentage points in the loan to GDP ratio and an increase in cumulative unemployment of 0.5 (over three years). Such shocks also resulted in a cumulative contraction of about one percentage point in real GDP (over two years), and a cumulative decrease in inflation of 0.6 percentage points (over three years). Finally, Morakinyo et al. (2018) found the long-term impact of impulses on NPL in the banking and macroeconomic systems in Nigeria. Moreover, NPL also responds to innovations in all banking macro variables other than the exchange rate and growth rate against GDP.

3. Methodology

The data used in this research was secondary in the form of a quarterly time series, from 2008 to 2019, that came from the CSA (*Central Statistics Agency*), RFES (*Regional Financial Economics Statistics*), IBS (*Indonesian Banking Statistics*), and the FSA (*Financial Services Authority*). The data types with their magnitudes and sources are presented in Table 1.

Several problems in this research were analyzed using VAR (*Vector Autoregression*) as its data analysis technique. Subsequently, if the data indicated to be stationary in the first difference, the VAR model would be combined with the error correction model to become a VECM (*Vector Error Correction Model*). Mathematically, the general model could be formulated as follows:

$$\begin{aligned}
 \text{REG}_t = & \alpha_0 + \sum_{i=1}^k \alpha_1 \text{REG}_{t-1} + \sum_{i=1}^k \alpha_2 \text{INF}_{t-1} \\
 & + \sum_{i=1}^k \alpha_3 \text{LDR}_{t-1} + \sum_{i=1}^k \alpha_4 \text{NPL}_{t-1} + e_t
 \end{aligned}
 \tag{1}$$

$$\begin{aligned}
 \text{INF}_t = & \beta_0 + \sum_{i=1}^k \beta_1 \text{INF}_{t-1} + \sum_{i=1}^k \beta_2 \text{REG}_{t-1} \\
 & + \sum_{i=1}^k \beta_3 \text{LDR}_{t-1} + \sum_{i=1}^k \beta_4 \text{NPL}_{t-1} + e_t
 \end{aligned}
 \tag{2}$$

It showed that α_0 and β_0 were constants; $\alpha_1, \alpha_2, \alpha_3, \alpha_4$ and $\beta_1, \beta_2, \beta_3, \beta_4$ were the regression coefficients; REG is Regional Economic Growth-YoY, calculated based on the province's real regional GDP (constant price 2010); INF is inflation calculated based on real provincial CPI; LDR is a Loan to Deposits Ratio as a proxy for liquidity; and NPL is non-performing loans, a comparison of loan loss to total loans.

The VAR analysis procedure included a series of stages starting from the first phase of testing the variable stationarity conditions. If the data was firm at the purposed level, further utilization of VAR will be done. However, if it was found to be unstable, VECM would be used. In the second phase, the order/lag length model was selected, while in the third phase, the co-integration test between variables was performed. This procedure was used to determine whether the VAR method to be applied was considered to be VAR, VARD, or VECM. The fourth phase continued by analyzing the VAR, VARD, or VECM models that were carried out, along with the fifth phase for interpretation of the model. Then in the sixth phase, the Granger causality test and analysis were performed, and last, the seventh phase was for conducting IRF (*Impulse Response Function*) and VarDec (*Variance-Decomposition*) assessment.

4. Results

For the analysis of VECM, the condition of ENT province based on Table 2 can be seen from the long-term analysis which shows that the INF variable is negatively influenced by the REG variable; however, INF is positively influenced by LDR (loan to deposits ratio), while NPL does not affect

Table 1: Types and Sources of Data

Notation	Definition	Formula	Unit	Source
REG	Regional Economic Growth	$= \Delta \text{RGDP}_t / \text{RGDP}_{t-1} * (100)$	%	RFES, IBS
LDR	Loan-to-Deposits Ratio	$= \text{Loan} / \text{Deposits} * (100)$	%	IBS, FSA
NPL	Non-Performing Loans	$= \text{Loan loss} / \text{Loan} * (100)$	%	IBS, FSA
INF	Inflation	$= \Delta \text{CPI}_t / \text{CPI}_{t-1} * (100)$	%	IBS, RFES

Note: FSA: Financial Services Authority; CSA: Central Statistics Agency; IBS: Indonesia Bank Statistics; RFES: Regional Financial Economics Statistics; $\Delta \text{RGDP} = \text{RGDP}_t - \text{RGDP}_{t-1}$; $\Delta \text{CPI} = (\text{CPI}_t - \text{CPI}_{t-1})$.

Table 2: VECM Estimation Results for INF and REG Variables

Variables	WNT (West Nusa Tenggara)		ENT (East Nusa Tenggara)	
	INF	REG	INF	REG
	Coefficient	Coefficient	Coefficient	Coefficient
Long-Term				
REG(-1)	0.813***	–	–3.657 ***	–
INF(-1)	–	1.230	–	–0.273 **
LDR(-1)	–0.301**	–0.370**	0.294***	–0.080***
NPL(-1)	–35.376***	–43.525***	–3.487	0.954
C	98.367	121.026	–7.745	2.118
Short-Term				
CointEq1	0.019	–0.174	–0.050	–0.482 ***
D(INF(-1))	0.074	0.091	–0.134	–0.032
D(REG(-1))	–0.020	–0.110	0.021	–0.226
D(LDR(-1))	0.032	–0.094	0.025	0.017
D(NPL(-1))	–1.472	6.915	0.211	0.578
C	–0.336	0.605	–0.1982	–0.041

Note: ***Significant at $\alpha = 1\%$; **Significant at $\alpha = 5\%$; *Significant at $\alpha = 10\%$; WNT province, ADF-test at level: REG, Pr = 0.045; INF, Pr = 0.046; LDR, Pr = 0.851; NPL, Pr = 0.641; ADF test at FD (first difference): D(REG) Pr = 0.005; D(INF), Pr = 0.000; D(LDR), Pr = 0.000; D(NPL), Pr = 0.003. Unrestricted Cointegration Rank Test (Trace) at none-row, Pr = 0.0151. ENT province, ADF-test at level: REG, Pr = 0.000; INF, Pr = 0.696; LDR, Pr = 0.850; NPL, Pr = 0.192; ADF test at FD: D(REG) Pr = 0.000; D(INF), Pr = 0.000; D(LDR), Pr = 0.000; D(NPL), Pr = 0.000. Unrestricted Cointegration Rank Test (Trace) at none-row Pr = 0.000, at atleast1-row Pr = 0.000.

the inflation. In the REG variable, it shows that the effect of INF and LDR (Loan to Deposits ratio) is negative on REG, while NPL proved to have no effect on REG.

Empirical evidence of the INF-REG relation which is mutually influencing negatively shows the phenomenon of cost-push inflation. The implication is that if inflation decreases, real economic growth tends to increase and vice versa, whereas if economic growth decreases, inflation will increase. Furthermore, the positive LDR-INF relation implies that if there is an increase in liquidity, it will tend to increase inflation. In addition, the LDR-REG relation shows to be negative and the implication is that if there is an increase in liquidity, regional growth of real GDP will decline.

Meanwhile, for the condition of ENT province in the long-term analysis, it can be seen that the INF is positively influenced by REG, while the LDR and NPL variables have a negative effect on INF. The REG variable shows that INF does not affect REG. Meanwhile, the effect of LDR and NPL appear to be negative on REG. Empirical evidence of the INF-REG relation which is only one direction (i.e. REG has a positive effect on INF) shows that in the ENT area there

is a demand-pull inflation phenomenon. The implication is that if there is an increase in REG (*Economic Growth*), subsequently, inflation tends to rise as well (meaning there is an output gap, $Q_{AD} > Q_{AS}$) which causes prices in the output market to escalate. The negative LDR-INF relation implies that if there is an increase in saving which causes liquidity (LDR) to fall towards normal-healthy, inflation will grow under control. This is closely related to the negative LDR-REG relation, which implies if there is a surge in public saving which causes liquidity (LDR) to fall back to normal, it will cause inflation to rise under control and increase the growth of real GDP.

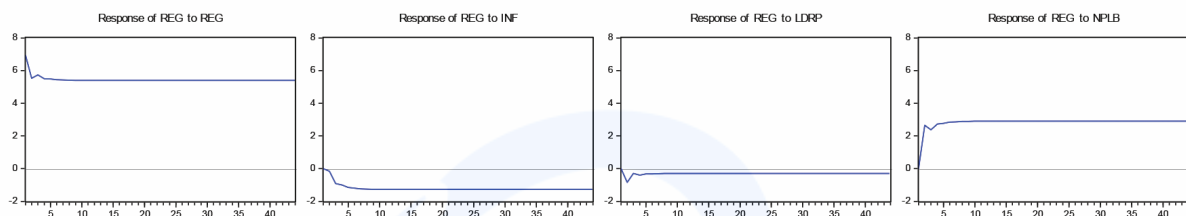
In the short-term analysis, it can be seen that INF and REG variables in WNT and ENT, the SOA (*Speed of Adjustment*) coefficient is not significant (except for the REG model in ENT). Hence, there is not sufficient statistical evidence to suggest a short-term to long-term adjustment mechanism in WNT and ENT. Whereas in the REG model, the SOA coefficient is significant, meaning that there is a REG adjustment mechanism from short to long term in ENT.

IRF (Impulse Response Function) estimation analysis aims to trace the shock/innovation variable against the

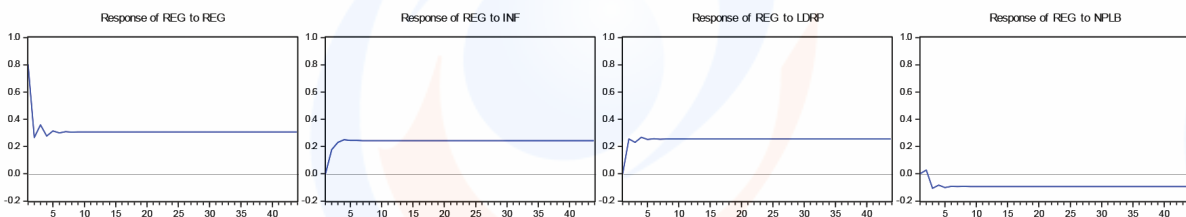
variable itself and to other variables. The assumption is that each innovation variable does not correlate with each other, therefore the tracking of the impact of a shock can be done directly. Moreover, the results of the IRF plot can be seen in Figure 2.1 and Figure 2.2.

Response of variable REG. Figure 2.1 shows that in WNT, the responses of REG to REG, INF, LDR, and NPL vary, as well as in ENT. On the other hand, the response from REG to REG in WNT is positive. Moreover, a shock of REG of 1 SD will be responded to by the REG variable itself ranging from 5.393% to 5.742%, starting from period 2 to 44, and remain

permanently stable from the 7th period. Meanwhile, in ENT, the response from REG to REG is positive. A shock of REG of 1 SD will be responded to by the REG itself ranging from -0.265% to 0.359%, starting from period 2 to 44, and remain permanently stable starting from the 7th period. The WNT response of REG to INF is negative. Furthermore, a shock of INF of 1 SD will be responded to by REG ranging from -1.277% to -0.170% and remain permanently stable starting from the 7th period. In addition, the response of REG to INF in ENT is positive, where the shock of INF of 1 SD is responded to by REG ranging from 0.177% to 2.50% and

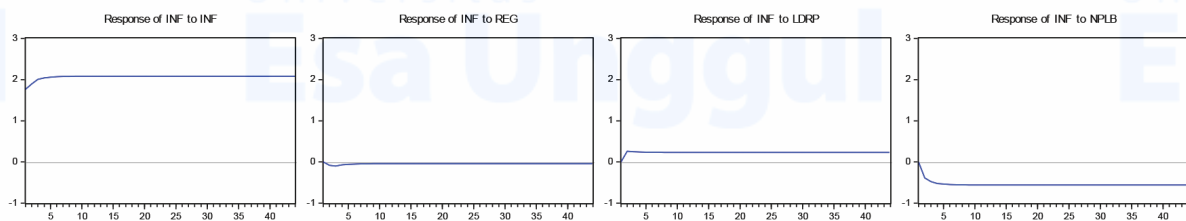


a. Response REG in WNT (*West Nusa Tenggara*)

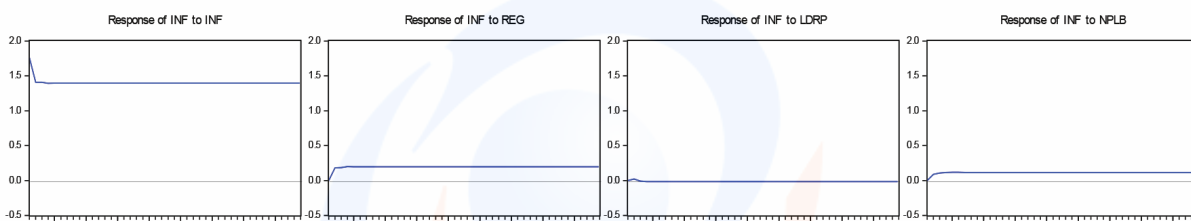


b. Response REG in ENT (*East Nusa Tenggara*)

Figure 2.1: Response to Cholesky One S.D Innovations, for REG variable in WNT (a) in ENT (b)



a. WNT (*West Nusa Tenggara*)



b. ENT (*East Nusa Tenggara*)

Figure 2.2: Response to Cholesky One S.D Innovations, for INF in WNT (a) in ENT (b)

Figure 2: Response to Cholesky One S.D Innovations, for REG (2.1) and INF (2.2)

remains permanently stable starting the 5th period. For the liquidity shock or the LDR shock, the response of REG to LDR in the WNT is negative, while the shock of LDR of 1 SD was responded to by REG ranging from -0.848% to -0.294% and remain stable from the 5th period. Meanwhile, for the response of REG to LDR in ENT, a shock of LDR of 1 SD was responded to by REG in the range of 0.23% to 0.269% and remain stable from the 5th period. For the NPL shock (*credit risk shock*), the response of REG to NPL in WNT is positive, while the shock of NPL of 1 SD is responded to by REG ranging from 2.371% to 2.904% and remain stable from the 8th period. Meanwhile, the response of REG to NPL in ENT was positive, while a shock of NPL of 1 SD is responded to by REG ranging from -106% to 0.028% and remains stable from the 5th period.

Response of variable INF. Figure 2.2 shows that in WNT and ENT, the response of INF to REG, LDR, and NPL varies. In WNT, the response from INF to INF is positive, while a shock of REG of 1 SD will be responded to by the REG itself, ranging from 1.895% to 2.082% , and remain permanently stable starting from the 2nd period. Furthermore, the response of INF to INF in ENT is positive, while a shock of REG of 1 SD will be responded to by the REG itself, ranging from 1.467% to 1.543% , and remain stable from the 3rd period. In WNT, the response INF to REG is negative, while the shock of REG of 1 SD is responded to by INF ranging from -0.099% to -0.418% (from period 2 to 44) and remains permanently stable starting from period 5. Meanwhile, the response to INF to REG in ENT is positive, while a shock of REG of 1 SD is responded to by REG ranging from 0.009% to 0.091% and remains permanently stable from the 2nd period.

In WNT, the response of INF to LDR is negative, while the shock of LDR of 1 SD was responded to by INF ranging from 0.231% to 0.258% and remain permanently stable starting the 2nd period. Meanwhile, the response of INF to

LDR in ENT is positive, while the shock of LDR of 1 SD is responded to by INF ranging from 0.064% to 0.087% percent and remains permanently stable starting the 5th period. For the NPL shock, the response of INF to NPL in WNT is positive. INF's response to the shock of NPL of 1 SD ranged from -0.561% to 0.390% and remain permanently stable starting the 6th period. Meanwhile, the response of INF to NPL in ENT is positive. Furthermore, the shock of NPL of 1 SD was responded to by INF ranging from 0.007% to 0.046% , and remain permanently stable starting the 2nd period. Consequently, the summary of the results of the IRF analysis is shown in Table 3 below.

Furthermore, FEVD (*Forecast Error Variance Decomposition*) aims to measure the estimated error variance of a variable, namely how much difference is between before and after the shock, both from the variable itself and also from other related variables. Based on the FEVD results, the average variance decomposition result is 44 quarters and can be seen in Table 3.

In WNT, the REG variable shows that the variable that has the biggest contribution to REG is the REG itself with an average contribution per quarter of 78.051% , followed by NPL of 18.448% , INF of 3.160% , and LDR of 0.340% . Meanwhile, in ENT, the REG variable shows that the variable that has the largest contribution to REG is the REG itself with an average quarterly contribution of 52.186% , followed by LDR of 23.843% , INF of 20.945% , and LDR of 3.026% .

In WNT, the INF variable shows that the variable that has the largest contribution to INF is the INF itself with an average quarterly contribution of 92.860% , followed by NPL of 5.920 , REG of 0.067% , and LDR of 1.152% . Meanwhile in ENT, the INF variable shows that the variable that has the largest contribution to INF is the INF itself with an average quarterly contribution of 99.697% , followed by an LDR of 0.258% , REG of 0.034% , and NPL of 0.010% .

Table 3: Response of REG and INF to Shock REG, INF, LDR, and NPL in the Amount of One SD Innovations

Variables	WNT (<i>West Nusa Tenggara</i>)		ENT (<i>East Nusa Tenggara</i>)	
	Response of REG	Response of INF	Response of REG	Response of INF
Shock REG	Positive and permanent stable from the 6 th period	Negative and permanent stable from the 5 th period	Positive and permanent stable from the 5 th period	Positive and permanent stable from the 2 nd period
Shock INF	Negative and permanent stable from the 7 th period	Positive and permanent stable from the 5 th period	Positive and permanent stable from the 5 th period	Positive and permanent stable from the 2 nd period
Shock LDR	Negative and permanent stable from the 5 th period	Positive and permanent stable from the 2 nd period	Positive and permanent stable from the 5 th period	Positive and permanent stable from the 5 th period
Shock NPL	Positive and permanent stable from the 8 th period	Negative and permanent stable from the 6 th period	Negative and permanent stable from the 5 th period	Positive and permanent stable from the 2 nd period

4.1. Discussion

4.1.1. Condition of WNT Province

The REG-INF is a one-way relation, where only REG affects INF positively, and INF does not affect REG. This information shows that there is a demand-pull inflation phenomenon. Consequently, the INF-REG relation is insignificant, which shows that REG changes are not due to alterations in INF and there is no inflationary effect on economic growth in WNT. Theoretically, inflation will increase the MC (*Marginal Cost*) of each real sector activity. If inflation is accompanied by an increase in people's income, then AD will increase, hence $MR > MC$, the increase in MC will be offset by an increase in MR (*Marginal Revenue*). In conditions such as inflation, it will increase the performance of market output, thus economic growth will escalate. On the other hand, this condition is not statistically proven in WNT. Meanwhile, if inflation is not accompanied by an increase in income (relatively fixed income), subsequently demand will be weakened by inflation. In this condition, what happens is $MR < MC$, in which the market output performance decreases. In macroeconomics, this condition is described by a shift in the AS curve to the left, while AD is relatively constant, allowing equilibrium to occur, marked by a decrease of Q (*Output*) and increase of P (*Price*). Logically, if the decrease in Q_{AS} is greater than Q_{AD} , there will be an output gap, which leads to the rise of the inflation rate. Inflation in this context becomes an obstacle to the economic development, where this condition is also not proven in WNT.

REG-INF relation is positively significant, which means that inflation is influenced by economic growth, which could also be interpreted as regional income growth. It is defined as positive due to the reason of increasing income growth that will augment inflation. Conversely, if income growth falls, then inflation will decline. It occurs due to the increase in productivity or production capacity in WNT is relatively small compared to the increase in the rate of income. If described graphically, it will show an increase in AD that is greater than the increase in the US, therefore when equilibrium occurs, there will be an increase in Q (REG) followed by an increase in P (*Inflation*). Such reason justifies the positive relation of REG-INF, where this phenomenon is related to the significantly negative LDR-REG relation. Thus, it is necessary to note that the LDR of WNT province is on average more than 100% with an upward trend, while the effect of increasing LDR is actually decreasing REG. This means that loans are faster than deposits from the banking industry in WNT; however, this has not been able to increase production capacity as expected. This is related to the rising trend of LDR and always above 100% since this shows that the source of funds for increasing bank credit is partially obtained from the money market with a high cost of funds.

As a consequence, credit interest rates in WNT are high. This condition causes the growth of small investments in the real sector, and consequently, economic growth becomes smaller and declines, which leads to the reason why in WNT, the LDR-REG connection is negative. Thus, the aforementioned finding contradicts the supply leading hypothesis theory.

Furthermore, the negative relation of LDR-INF happens due to the negative relation of LDR-REG, namely increasing liquidity that decreases the rate of economic growth, or decreases the rate of income growth, or decreases the purchasing power of the people in WNT. To reach equilibrium, producers respond to market demand by lowering the rate of P (*Price Level*) to maximize revenue, since some consumers are elastic. To summarize the logical flow, if LDR increases, subsequently REG will decrease (meaning income falls and purchasing power falls) which leads to an equilibrium, marked by a decrease in the rate of inflation. This is the rationale of the negative relation of LDR-INF, where the pattern of LDR-REG relation also occurs in NPL behavior related to INF and REG, namely if the rate of NPL increases (risk increases), REG and INF tend to fall.

4.1.2. ENT Province Conditions

The INF-REG relation is negative (*reciprocal*). This shows that there is a phenomenon of cost-push inflation. Its indication can be seen from the growth of Q (REG) which has a negative effect on P , vice-versa, where the effect of INF on REG is significantly negative. This shows that changes in inflation are against the direction of changes in the regional economic growth. Every activity in the real sector in ENT will suffer losses if inflation rises due to the decrease of MR and the increase of MC, in which producers are forced to reduce their production/sales. In macroeconomics, this will reduce the growth of Q -aggregate, hence the reason why the INF-REG relation is negative.

The effect of REG on INF is negative, where for this case, the REG variable is more accurately defined as the rate of regional income. The negative effect shows that if the income rate rises, the inflation rate tends to fall, and if the income rate decreases, the inflation rate tends to rise. This indicator provides information that in ENT, the growth in productivity or production capacity is relatively constant. The implication lies in the fact that an increase in people's income will be followed by a growth in inflation in which the increase in people's purchasing power in ENT is constrained, and the growth in production capacity is stagnant, which shows why the REG-INF relation is negative. Such a phenomenon is associated with a negative LDR-REG relation and a positive LDR-INF relation.

Meanwhile, the negative LDR-REG relation shows that the effect of financial development on economic development is negative, where it should be positive.

The question of why increased liquidity can only increase Q in a shrinking Q growth is due to the increase by the result of idle capacity utilization, not by the reason of an expansion of production capacity financed by bank credit. Hence, it is the motive of why the effect of LDR on REG is negative and also related to a positive LDR-INF relation.

On the contrary, the positive relation of LDR-INF shows a negative REG-INF relation and a negative LDR-REG relation. In this case, is defined as a decrease in REG and a decrease rate of growth of Q (Q increases, but growth decreases). The shrinking rate of growth Q shows that the expected production target has not been achieved and there is still a shortage of Q (production of goods/services) including an output gap since $Q_{AD} > Q_{AS}$, which triggers the inflation rate to rise. To summarize the logical flow, it started from an increase in LDR, resulting in a decreasing REG (due to the relatively constant capacity) that leads to an output gap, which makes P increases (inflation rate). This is the reason why the influence of the LDR on INF is positive. Such finding supports QTM (*Quantity Theory of Money*), that is, if MS increases, ceteris paribus, then P will increase.

5. Conclusion and Implication

In WNT province, the results of long-term VECM analysis show that the REG (Real Economic Growth) or Q-Growth variable has a positive effect on INF (Price Level). However, INF itself does not significantly affect REG (REG-INF relationship, one-way relationship). While the role of the banking sector in the real sector has not been as expected, this can be seen from the development of liquidity and NPL which negatively affects REG (although liquidity and NPL appear to be able to reduce price levels). The results of the IRF (Impulse Response Function) analysis show that the REG variable demonstrates a positive response to shock/innovation from the REG itself and NPL, while the REG reaction presents a negative response to shock/innovation from INF and liquidity as well the INF variable leads to a positive reaction to shock/innovation INF itself and liquidity and the INF shows a negative response to shock/innovation variables REG and NPL.

In ENT province, the VECM long-term results show that the REG variable has a negative effect on INF, and conversely the INF variable itself has a significant negative effect on REG (REG-INF relationship, affects each other in two directions). While the role of the banking sector in supporting the real sector in ENT has not been as expected, this can be seen from the development of liquidity which has a negative effect on REG and has a positive effect on INF. In the IRF analysis, it is proven that the REG variable is positive for shock/innovation of REG itself, INF, and

liquidity, while for shock/innovation of NPL, the response of REG is negative and the response of INF variable is positive to shock/innovation of INF itself, REG, liquidity, and NPL (entirety).

To increase economic activity in the WNT and ENT provinces towards high, stable, and sustainable economic growth, inflation control and a synergistic role in the banking sector are required to enable banks to support regional economic development financing. Based on the conclusion, where in WNT there is a DPI (Demand-Pull Inflation) phenomenon while in ENT there is a CPI (Cost-Push Inflation) phenomenon, and in the two provinces it is indicated that liquidity has not been able to reach the objective target. This implies normalizing and increasing the synergy of banking sector relations with the real sector in WNT and ENT, where it can be started by reformulating the banking sector strategy in mobilizing public funds. The essence of the reform should contain the method to implement a supply-leading strategy, namely a regional development strategy starting from the development of the financial sector to be able to encourage the development of the real sector to grow sustainably.

Therefore, the effectiveness of banking functions in funding and placement must be supported by stakeholders. Hence, important factors that should be the main concern are:

- a) Funding, by trying to make the banking sector use more sources of public savings funds in a large proportion in which the COF (Cost of Fund) and LR (Lending Rate) of banks will decrease. It is important to create a synergy in the form of reducing business risk and regional inflation, thus, this will increase investment in the real sector.
- b) Placement, where banks should be more selective and pay more attention to providing investment credit and working capital in large proportions to ensure that regional production capacity increases and leading investment sector in the regions grow.
- c) Efforts to control inflation, through a combination of fiscal policies and via monetary policy, are made to ensure that the macroeconomic rate of income growth is greater than the rate of inflation.
- d) The communities and local governments of WNT and ENT are able to take advantage of opportunities arising from central government policies to accelerate regional backwardness. Thus, the local government must be able to take advantage of the opportunities that will arise from central government programs, especially in infrastructure and superstructure development programs, which is important to increase the effectiveness of production, distribution, and consumption of the WNT and ENT people.

References

- Accornero, M., Alessandri, P., Carpinelli, L. & Sorrentino, A. M. (2017). *Non-performing loans and the supply of bank credit: Evidence from Italy* (Questioni di Economia e Finanza Occasional Paper, 374). Bank of Italy <https://www.bancaditalia.it/pubblicazioni/qef/2017-0374/index.html?com.dotmarketing.htmlpage.language=1>
- Ascarya, A. (2012). Transmission channel and effectiveness of dual monetary policy in Indonesia. *Buletin Ekonomi Moneter dan Perbankan*, 14(3), 269–298. <https://doi.org/10.21098/bemp.v14i3.405>
- Avdjiev, S., & Zeng, Z. (2014). Credit growth, monetary policy, and economic activity in a three-regime TVAR model. *Applied Economics*, 46(24) 2936–2951. <https://doi.org/10.1080/00036846.2014.916391>
- Bahadir, B., & Gumus, I. (2016). Credit decomposition and business cycles in emerging market economies. *Journal of International Economics*, 103(3), 250–262. <https://doi.org/10.1016/j.jinteco.2016.10.003>
- Behera, C. (2021). Economic globalization and financial development: Empirical evidence from India and Sri Lanka. *The Journal of Asian Finance, Economics, and Business*, 8(5), 11–19. <https://doi.org/10.13106/jafeb.2021.vol8.no5.0011>
- Bibi, S. & Rashid, H. (2014). Impact of trade openness, FDI, exchange rate and inflation on economic growth: A case study of Pakistan. *International Journal of Accounting and Financial Reporting*, 4(2), 236–257. <https://doi.org/10.1.1.1013.6163>
- Bist, J. P. (2018). Financial development and economic growth: Evidence from a panel of 16 African and non-African low-income countries. *Cogent Economics and Finance*, 6(1), 1449780. <https://doi.org/10.1080/23322039.2018.1449780>.
- Berger, A. N., & Udell, J. (2014). Bank liquidity creation and real economic output. *Journal of Banking and Finance*, 10(1), 36–49. <http://doi.org/10.2139/ssrn.2515361>
- Bernanke, B. S. & Gertler, M. (1995). Inside the black box: The credit channel of monetary policy transmission. *Journal of Economic Perspectives*, 9(4), 27–28. <https://doi.org/10.1257/jep.9.4.27>
- Bernanke, B. S. & Blinder, A.S. (1988). Credit, money, and aggregate demand. *The American Economic Review*, 78(2), 435–439. <https://www.jstor.org/stable/1818164>
- Camba, A. C. J., & Camba, A. L. (2020). The dynamic relationship of domestic credit and stock market liquidity on the economic growth of the Philippines. *The Journal of Asian Finance, Economics, and Business*, 7(1), 37–46. <https://doi.org/10.13106/jafeb.2020.vol7.no1.37>
- Dritsaki, C. & Dritsaki-Bargiota, M. (2005). The causal relationship between stock, credit market and economic development: An empirical evidence for Greece. *Economic Change and Restructuring*, 38(1), 113–127.
- Dinh, D. V. (2020). The impulse response of inflation to economic growth dynamics: VAR Model analysis. *The Journal of Asian Finance, Economics, and Business*, 7(9), 219–228. <https://doi.org/10.13106/jafeb.2020.vol7.no9.219>
- Eggoh, J. C., & Khan, M. (2014). On the nonlinear relationship between inflation and economic growth. *Research in Economics*, 68(2), 133–143. <https://doi.org/10.1016/j.rie.2014.01.001>
- Huljak, I., Martin, R., Moccero, D., & Pancaro, C. (2020). *The macroeconomic impact of NPLs in Euro area countries* (SUERF Policy Note, Issue No 185). The European Money and Finance Forum. <https://www.suerf.org/policynotes/15979/the-macroeconomic-impact-of-npls-in-euro-area-countries>
- Hung, F. S., & Cothren, R. (2016). Credit market development and economic growth. *Journal of Economics and Business*. 54(2), 219–237. [https://doi.org/10.1016/S0148-6195\(01\)00063-7](https://doi.org/10.1016/S0148-6195(01)00063-7)
- Jumono, S., Sofyan, J. F., Sugiyanto, S., & Mala, C. M. F. (2020). The short-run and long-run dynamics between liquidity and real output growth: An empirical study in Indonesia. *The Journal of Asian Finance, Economics, and Business*, 8(5), 595–605. <https://doi.org/10.13106/jafeb.2021.vol8.no5.0595>
- Jumono, S., Baskara, I., Abdurahman, A., & Mala, C. M. F. (2021). The dynamics of economic growth in underdeveloped regions: A case study in Indonesia. *The Journal of Asian Finance, Economics, and Business*, 8(4), 643–651. <https://doi.org/10.13106/jafeb.2021.vol8.no4.0643>
- Klein, N. (2013). *Non-Performing Loans in CESEE: Determinants and macroeconomic performance*. (IMF Working Paper WP/13/72). European Department, International Monetary Fund. <https://www.imf.org/en/Publications/WP/Issues/2016/12/31/Non-Performing-Loans-in-CESEE-Determinants-and-Impact-on-Macroeconomic-Performance-40413>
- Levine, R., & Zervos, S. (1998). Stock markets, banks, and economic growth. *American Economic Review*, 88(3), 537–558. <https://www.jstor.org/stable/116848>
- Mandala, R. A. M. (2020). Inflation, government expenditure, and economic growth in Indonesia. *Jambura Equilibrium Journal*, 2(2), 1–10. <https://doi.org/10.37479/jej.v2i2.6961>
- Mankiw, N. G. (2019). *Macroeconomics* (10th ed.). New York, NY: Worth.
- Mishkin, S. F. (2016). *The economics of money, banking, and financial markets*. Boston, MA: Pearson Addison Wesley.
- Monsura, M. P., & Villaruz, R. M. (2021). Long-run equilibrium relationship between financial intermediation and economic growth: Empirical evidence from the Philippines. *Journal of Asian Finance, Economics, and Business*, 8(5), 21–27. <https://doi.org/10.13106/jafeb.2021.vol8.no5.0021>
- Morakinyo, A., Muller, C., & Sibanda, M. (2018). Non-performing loans, banking system, and the macroeconomy. *Studia Universitatis Babeş-Bolyai Oeconomica*. 63(2), 67–86. <https://doi.org/10.2478/subboec-2018-0009>
- Nkusu, M. (2011). *Non-performing loans and macro-financial vulnerabilities in advanced economies*. (IMF Working Paper – WP/11/161). Strategy, Policy, and Review Department, International Monetary Fund. <https://www.imf.org/external/pubs/ft/wp/2011/wp11161.pdf>

- Rosoiu, I. (2015). The impact of the government revenues and expenditures on the economic growth. *Procedia Economics and Finance*, 32(15), 526–533. [https://doi.org/10.1016/s2212-5671\(15\)01428-8](https://doi.org/10.1016/s2212-5671(15)01428-8)
- Satria, D. (2012). Correlation between inflation and economic growth in Indonesia. *Jurnal Ecosains Universitas Negeri Padang*, 1(2), 1–12. <http://ejournal.unp.ac.id/index.php/ekosains/article/view/3487>
- Seprillina, L., Ghozali M., & Khusaini, M. (2016). Analysis of monetary policy response and macroprudential policy in the transmission mechanism of the credit line monetary policy in Indonesia. *International Journal of Social and Local Economic Governance (IJLEG)*. 2(1), 1–12. <https://ijleg.ub.ac.id/index.php/ijleg/article/view/29>
- Sipahutar, M., Oktaviani, R., Siregar, H., & Juanda, B. (2017). Linkage of credit on BI rate, funds rate, inflation and government spending on capital. *JEJAK: Jurnal Ekonomi dan Kebijakan*, 10(1), 1–11. <http://dx.doi.org/10.15294/jejak.v10i1.9123>
- Sriyalatha, M. A. K., & Torii, H. (2019). Impact of fiscal policy on economic growth: A comparison between Singapore and Sri Lanka. *Kelaniya Journal of Management*, 8(1), 26–37. <https://doi.org/10.4038/kjm.v8i1.7559>
- Supartoyo, Y. H., Tatuh, J., & Sendouw, R. H. E. (2013). The economic growth and the regional characteristics: The case of Indonesia. *Buletin Ekonomi Moneter dan Perbankan*, 16(1), 3–19. <https://doi.org/10.21098/bemp.v16i1.34>
- Taylor, W. J., & Zilberman, R. (2016). Macroprudential regulation, credit spreads, and the role of monetary policy. *Journal of Financial Stability*, 26 144–158. <https://doi.org/10.1016/j.jfs.2016.08.001>
- Todaro, M. P., & Smith, S. C. (2015). *Economic development* (12th ed.). London, UK: Pearson Education Limited.