Jurnal Sains Matematika dan Statistika
p-ISSN: 2460-4542
e-ISSN: 2615-8663

Boosting Housing Markets: Amplifying Reserve Requirements for Greater Economic Growth, Insights from China and Indonesia

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Abstract

Enhancing the inclusivity, safety, resilience, and sustainability of urban areas, as outlined in Goal 11 of the Sustainable Development Goals (SDGs) to be accomplished by 2030, entails ensuring universal access to adequate, secure, and affordable housing along with essential services, and the enhancement of informal settlements. Consequently, numerous megacities worldwide grapple with burgeoning populations, precipitating a surge in housing costs, particularly exacerbated by volatile financial environments. The post-2013 financial recuperation in the United States precipitated a capital exodus towards Emerging economies, precipitating currency depreciation and imported inflation due to heavy reliance on foreign reserves. In response, the Indonesian central bank augmented reserve requirements to curtail money supply, while its Chinese counterpart reduced such requisites to stimulate economic expansion. This inquiry endeavors to discern the short-term impact of heightened reserve requirements on consumer, investment, and working capital credit pertinent to housing consumption, and in the long run, examines their ramifications on total output within the current account. Employing the Vector Error Correction Model (VECM), this study scrutinizes the central bank's credit policies' influence on overall output over both temporal horizons. Augmenting reserve requirements, integral to banks' balance sheets, impinges on liquidity and credit provisioning capacities, affecting not only consumer and housing credit but also investment and working capital credit, crucial financing conduits bolstering real sector activity and economic growth.

***Keywords*:** *Reserve Requirement, Credit, Economic Growth, Vector Auto Regression, Vector Error Correction Model*

1. Introduction

1.1 Background

In 2013, an economic recovery was occurred in the United States (US) after a long financial crisis since 2008. The economic improvement in the US was followed by the decrease in investment growth in some emerging market countries like China and Indonesia which affected foreign investors to move their securities to US. Referring to the data from Bank Indonesia, the central bank of Indonesia, on June 2014, there was a capital outflow phenomenon by foreign investors in obligation market of about USD 4.1 billion. Most recently, China's foreign exchange reserves went down by $93.9 billion. China still had $3.56 trillion at the end of August.

In order to respond to the increase in inflation, Bank Indonesia decided to apply a monetary policy at the end of 2013. Bank Indonesia announced "PERATURAN BANK INDONESIA (PBI)" number: 15/15/PBI/2013 which explained an increase in reserve requirement ratio. The change is applied to the secondary reserve requirement from 2.5 percent to 4 percent and foreign exchange reserve requirement for foreign exchange bank from 1 percent to 8 percent. Besides that, Bank Indonesia (BI) also lowered the limit for upper value of Loan to Deposit Ratio of reserve requirement from 100 percent to 92 percent.

In China, the contrary strategy is applied to face the slow economic growth. Referring to China Briefing (2012), The People's Bank of China announced on May 13 that it would cut the amount of cash that banks must hold as reserves by 0.5 percentage points (50 basis points) recently released statistics pointed to a sharper-than-expected slowdown of the economy. The cut, which is the second this year following the first cut in February, will be effective from May 18, 2012. When a crisis happens in a country which is assigned by a growing inflation, an increase of reserve requirement ratio will help to maintain the stability of credit [27].

Furthermore, as a non-direct monetary instrument, the increase of reserve requirement will not affect the balance sheet of central bank; instead, it will provide a big effect to the common banks' liquidity [19]. The common banks play their role as the intermediary banks which are hoped to distribute the fund to people by lending channel. In Indonesia, the decrease of credit utilization as funding resource for real sector after applying the monetary policy of reserve requirement ratio affect the small companies which are dependent to investment credit and working capital credit to fund their operational cost.

Meanwhile, in China, the most prevalent credit utilization is going to property consumption. The monetary policy has impacted on the real estate market by two channels: money supply and interest rate [2]. The expansion of the money supply on both the investment sector and the consumption sector has promoted the booms of housing supply and housing consumption demand, and then

exacerbated the constant increase of housing prices [33]. Corporate loans backed by buildings have grown almost fivefold since 2008 and residential mortgages have been more than tripled in the period among lenders rated [11].

The property loans held by China's four biggest lenders soar to a total of 2.26 trillion yuan ($364 billion), according to the annual reports. At the moment, the decline in investment credit and working capital credit will rearrange the funding structure of real sector as it will affect its output whereas decrease the real estate selling growth in China. Indirectly, the rise in reserve requirement ratio also has impact to economic growth specifically for the amount of output which originates from the real sector. This research is aimed to observe and find out the effect of an increase in the reserve requirement ratio to credit supply as funding resource in the short term and finding the total output in the long term related to the decline of credit supply links to housing in China and Indonesia.

1.2 Research Objectives

a) To observe the effect of reserve requirement change as a monetary instrument which is related to credit supply in Indonesia and China for the short term;
b) To analyze the effect of credit supply in Indonesia and China related to current account both in short term and long term;
c) Assessing housing property links to consumer credit;

2. Literature Review

2.1 The Role of Credit

The role of credit in order to support stability of the bank's liquidity is quite different. When a bank needs more liquidity, then the role of credit to handle this case is to make sure that the growth of credit supply is slower. Besides the interest rate, the credit availability is also affected by the bank internal condition which one of them is the credit supply ratio to the amount of deposits or loan deposit to ratio (LDR) [21]. According to UU No.7 1992, credit is a money providing or bill based on the agreement or lending system dealing bank as creditor and a debtor that obligates the debtor to pay the payable after a certain period including the interest**.** Credit interest which is returned by the debtors will increase the net interest margin and lead to the increase in bank's revenue.

Based on Indonesia Banker Association, there are three types of credits according to their functions :

a) Working Capital Credit, is a credit that is given by bank to provide the debtor's working capital credit. Those credit is given to guarantee the business circle which will affect the company's balance sheet especially its inventory. Product types of KMK are overdraft, credit futures, clean up system loan, export credit, wessel export negotiation and trust receipt.

b) Investment credit is a credit that is given to pay the fixed assets that are utilized to support the business activities.
c) Consumer credit is a credit that is used to buy consumptive things like house, apartment, car and for consumption purposes. The product types of this credit are house owner credit, bike owner credit, loans without collateral, multi-function credit, credit card, and grocery credit.

2.2 Transmission of Reserve Requirement to Money Supply by Credit System

The best monetary policy is not an expansionary policy because this kind of policy will increase the citizen's expectation about the inflation so the price level has the risk to increase [19]. Indeed, as one of the monetary policy's goals, the price stability can be defined as the inflation controller which can make it low and stable which the low and stable inflation rate can support the output production.

The recent years, the monetarist empirically shows that controlling money supply is better than controlling interest rate [21]. Controlling interest rate will cause the instability of price which creates the risk of interest rate fluctuation. He mentioned that on the supply side, the only factor that is affected by central bank within control the total of money supply in order to control the inflation is through the credit of the common banks. The equation for money supply by the central bank can be written as follow :

$$\textit{Money supply} = \text{NFA} + \text{NCG} + \text{NDC} - \text{NOI} \quad (1)$$

NFA is foreign assets total that are invested in Indonesia. In order to keep the stability of economy, the total NFA has already been concluded earlier by the government. NCG is the total fund for government's operational activities that was applied based on government's budget or RAPBN. NOI is a fund for other emergency necessary which is a constant. Whereas, NDC is a total fund that is used to attract the economic sector and is distributed as a bank credit. The arrangement of credit is employed by the reserve control or reserve ratio as a monetary instrument. The bigger the amount of bank reserve, the ability to lend money is also get bigger.

The significant rising of credit growth will increase vulnerability of financial system [12]. This situation is also supported by the bankers who are likely to be procyclical. This characteristic is kind of systemic risk which needs to be considered carefully by the central bank. Therefore, one of macroprudential policy goals, in this case is the increase in reserve requirement ratio, is creating less procyclically character in the financial sector. Credit policies which are usually employed are :

1. The fixed ratio of credit for property
2. Reserve requirement ratio
3. Accomplishment of Capital Adequacy Ratio

Reserve requirement is the provision of the central bank which requires the common banks to maintain their liquidity or reserved assets in a certain percentage of their current liabilities or in this case, the customer's deposits [21]. Therefore, a bank is allowed to supply the credit and buy marketable securities as an investment. Primary reserve requirement is important by the reason that primary reserve requirement presents the main capability of the bank to accomplish its liabilities to the customers [16]. The investors in the bank have a right to liquefy their assets anytime. Hence, the primary reserve is a guarantee for the customer's deposits liquidity as a financial provider institution.

As an indirect instrument, the reserve requirement does not affect the money supply directly [19]. Through this instrument, the central bank is aimed to control the amount of money supply by managing banks' liquidities in the beginning. If central bank wants to decrease its money supply, it will increase reserve requirement ratio which will make the common bank's liquidity decreased. On the other hand, in order to add the amount of money supply, central bank will decide a monetary expansion by decreasing the reserve requirement.

Reserve requirement acts like tax where the central bank does not pay the interest of the reserve requirement supplied. On the other hand, the common banks have the profit loss if they drain the money as credit. The increase of credit is possible to be uncontrolled so that the reserve requirement is applied as the constraint [1]. Reserve requirement will create limitation to the liquidity and decrease the bank's capacity to supply the credit. The credit market reaches its equilibrium when the amount of credit demands equals to the amount credit supply.

2.3 The Effect of Money Supply to Housing Credit

The real estate price may be affected by the change of monetary policy by adjustment through some channels [33]. The first channel, bank loan rate will give impact to the change of mortgage rate and the rate on property development projects so that the demand for loans to the real estate sector will change. The previous situation will lead the price of real estate sector to accelerate or decelerate. On the other hand, the mortgage rate is lower than the return on real estate investment in China, interest rate policy will not be sufficient to control the demand for real estate. The second channel is expansion or contraction in the growth of money supply may rise or drop the loan-making ability of common banks and change the supply of credit to real estate sector. The loan changing supply will also lead the public's inflationary expectation and the demand for real estate assets. Both channels will lead to a positive impact of money supply growth on the change in real estate price growth. The increase in money supply indicates the increase in Gross Domestic Products (GDP) and income.

Table 1. Nationwide GDP Index, Average Disposable Income Index, Average House Price and Rental Indices, China 2000-2009 (2000=100)

Year	GDP Index	Per Capita Disposable Income Index	Residential House Price Index	Residential House Rental Index
2000	100.00	100.00	100.0	100.00
2001	110.29	109.23	100.49	108.10
2002	121.03	122.66	105.98	110.26
2003	136.61	134.91	112.02	118.53
2004	160.81	150.03	122.55	121.14
2005	184.28	167.09	132.84	121.75
2006	213.16	187.25	141.34	123.45
2007	258.80	219.52	152.93	126.66
2008	302.42	251.29	163.79	129.45
2009	342.49	273.49	176.57	128.41

Source : National Bureau of Statistics of China

Third, the central bank's real estate credit on mortgage down payment requirements may increase or decrease the supply of mortgage credit and change the real estate price growth. Moreover, the People Bank of China also proclaimed a series to commercial banks to tighten the control on real estate loans.

2.4 The Effect of Credit Growth to Total Output

A model that is known as IS-LM by John Hicks is a basic depiction how monetary policy affects the transmission of real sectors to the total output [18].

$$Y = C + I + G + NX \quad (2)$$

Those equation show that the aggregate outputs (Y) is supported by consumption (C), investment (I), government spending (G), and net export (NX). A diagram to depict monetary transmission which is described by the picture as follows [3]:

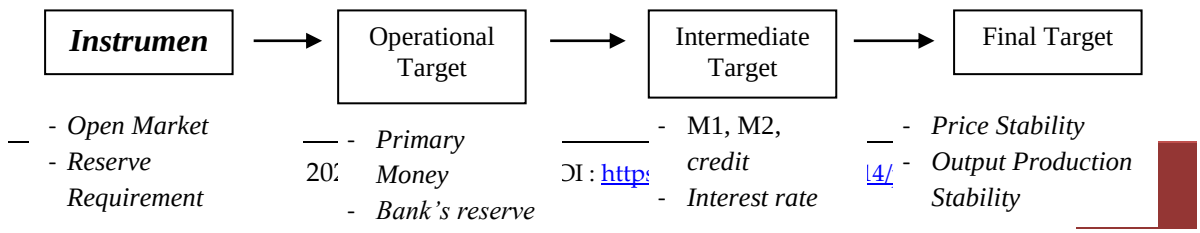

Figure 1. Monetary Transmission
Source : [21].

In addition, monetary policy can be specifically addressed to push the increase in total output by driving up the company to invest. In practice, the role of monetary sector is as a funding source for real sectors. Monetary policy can affect the increase of output productivity through some channels, one of them is loan (Mishkin ,2008). It is depicted by the figure below:

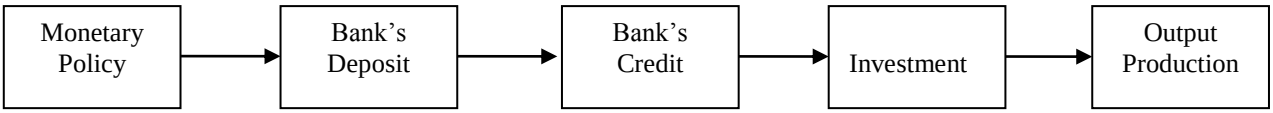

Figure 2. Bank Lending Channel of Monetary Policy
Source : [19].

As long as there is no perfect substitution of the deposit on banks with the other funding resource, bank credit channel from monetary transmission will be effective [19]. An expansionary monetary policy will increase the reserve of bank and the deposit of bank will increase the liquidity of credit on bank. The high dependency by many investors to credit bank will be disturbed by the increase of credit's rate. Eventually, it will affect the investment and output production.

As long as there is no perfect substitution, the bank credit supply of the monetary transmission will work effectively [19]. The expansionary monetary policy which increases the bank reserve and bank saving will increase the bank credit stocks. Many creditors depend on the bank credit to pay their activities, therefore, the increase of credit will cause the investment and consumption spending increase which on its turn will increase the amount of output. By its effects to the total output, credit will affect two aspects, the first is investment that is directly affected by the investment credit and working capital credit; the second is the consumption availability that is affected by the availability of consumer credit supply.

The Effect of change in reserve requirement ratio had been analyzed by Ben Bernanke and Alan Blinder in 1992. They found that change in reserve requirement ratio will affect economic growth at the end by change in credit at the release. They modified IS-LM model by added CC curve as part of leverage source to the fiscal sector. Another research about change in reserve requirement ratio of Indonesia found that the change of reserve requirement ratio affects credit negative significantly [29].

2.5 Fluctuation Change of Reserve Requirement and Credit System in Indonesia

In 2008, reserve requirement in Indonesia was started to be classified as the primary reserve and the secondary reserve. Bank Indonesia (BI) as monetary controller through PBI no. 10/19/PBI/2008, attachment of reserve in rupiah was applied 7.5 percent from deposits (consisting of 5 percent of primary reserve and 2.5 percent of secondary reserve), while the reserve in foreign exchange was about 1 percent of total deposits.

In 2010, through PBI no. 12/19/PBI/2010, Bank Indonesia increased the primary reserve ratio in rupiah to 8 percent of total deposits. Meanwhile, the secondary reserve rate in rupiah was still 2.5 percent of deposits and reserve ratio in foreign exchange was 1 percent of deposits. The change was applied in GWM LDR which has a low limit LDR target of about 78 percent and upper limit LDR target of about 100 percent. A common bank that has a LDR less than the low limit LDR target and the common bank with LDR more than the upper limit LDR target was obligated to pay for the amount of additional reserve as explained by BI on PBI above.

In 2013, through PBI no.15/15/PBI/2013 Bank Indonesia increased the secondary reserve ratio in rupiah to 4 percent from deposits. Meanwhile, the primary reserve ratio in rupiah remained 8 percent of deposit, whereas the reserve ratio in foreign exchange increased significantly to 8 percent of deposits. The change was also applied to the upper limits of GWM LDR from 100 percent which decreased to 92 percent. This new regulation was applied to manage credit supply by bank. Since December 2013, bank with LDR rate of about 100 percent was obligated to pay for the additional reserve, and the amount will be calculated by BI.

2.6 Fluctuative Change of Reserve Requirement and Credit System in China

Since 2006, the People's Bank of China (PBOC) has implemented macroeconomic regulation control by frequently increasing the reserve requirement ratio (RRR) in order to control excess liquidity, decreasing inflation pressure and soaring bank loan scale [20]. The RRR was increased 27 times from January 2006 to March 2011 and reached historical peak of 20,0%. During this period, China's money supply and loan scale from 2006 to 2010 were 24,4% and 24,5%, respectively while the CPI increased by 16,6%.

Meanwhile the credit in China is still dominated by consumer credit. Moreover, the real estate sector plays an important role to contribute in consumer credit demand in China. Based on Financial Times, 22nd September 2009, nowadays, 80% of urban resident owned their apartment in China. So as long as home prices continue to surge, credit demand in the housing sector will grow

rather than decline. If the statement above mentioned that two "hollow holes" (local financing & home loans) are not plugged, a credit squeeze can be expected in 2014 and overall financing costs will go up.

There had been a long-term and stable relationship between monetary policies and housing prices [31]. There is a cointegration relationship existing among the broad money supply, the total amount of loans issued by financial institutions, the weighted average interest rate of LIBOR and the real estate price index. The relationship is the prerequisite for the effective transmission of monetary policies through real estate market.

2.7 Flow of the Idea Concept Paper

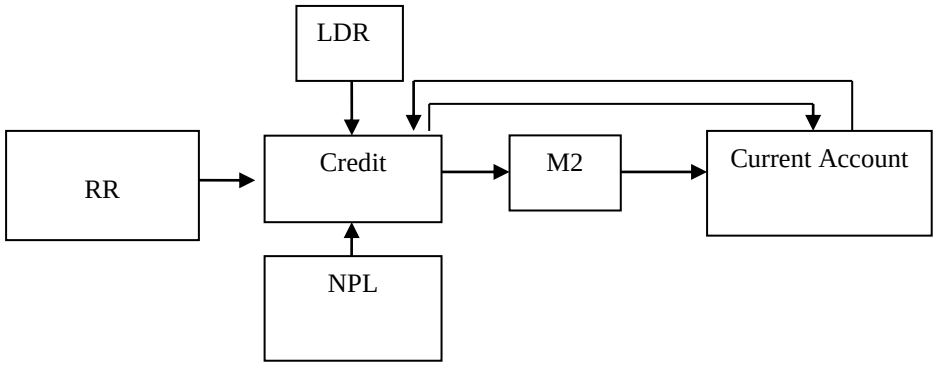

Figure 3. Flow of the Idea Concept Paper

2.8 Research Hypothesis

- The increase of reserve requirement affects the credit supply in the short term
- The credit supply affects the economic growth in the long term

3. Methodology

3.1 Vector Auto Regressive (VAR) and Vector Error Correction Model (VECM)

This research implements Vector Auto Regressive (VAR). While using VAR, researcher needs to pay attention to two things, first is variables which have a relation and second is lag maximum length that is used to catch the effect of change in one variable to the other variable. Generally, VAR can be written as auto regression model:

$$Y_t = A_0 + A_1 Y_{t-1} + A_2 Y_{t-2} + \ldots + A_p Y_{t-p} + \varepsilon_t \quad (3)$$

Where:

Y_t = Vector with n x 1 dimension, consists of n from each variable in the VAR

A_0 = Intercept vector with nx1dimenssion
$A_1, A_2, \ldots A_p$ = estimated coefficient matrix
p = the length of time which is used
ε_t = error vector with nx1 dimension
with assumption :
$E(\varepsilon_t)$ = 0
$E(\varepsilon_t, \varepsilon_s)$ = σ^2, for t = s and zero for else.

VAR model is started by data stationary test where VAR model (unrestricted VAR) will usually be created if the data has been stationary in the level. The stationary condition is indicated by the appearance of unit root while it shows that the mean, variance and covariance of a variable are not affected by the time (constant). Meanwhile, if it is not stationary in level stage but stationary in the same difference stage, a cointegration test needs to be tried to know if the data have a relation in long term or not.

If the data are stationary in a difference stage but they do not have any cointegration, then the estimation should be done with a VAR model in the difference stage. Meanwhile, if there is a cointegration among the data then the analysis should be continued by Vector Error Correction Model (VECM) which is a restricted VAR model. VAR model is estimated using Ordinary Least Square (OLS) estimator [13]. In every regression equation, dependent variable consists of the same amount of lag, therefore, OLS is able to estimate every partial equation efficiently. In VAR model, error (ε) is assumed as stochastic and interpreted whether as impulses, innovation or shock.

VECM analysis is employed after checking the amount of cointegration on model. Furthermore, Error Correction Term (ECT) on VECM model is an adjustment speed measurement from short-term equilibrium to long-term equilibrium [9]. The high values of ECT indicate a fast movement of adjustment speed by the dependent variable in an equation to long-term equilibrium and so does the contrary. VECM comes from VAR (k) reducing one of VAR's lag where the relevant variable is endogen. Generally, VECM (k-1) model can be written as below [23]:

$$\Delta y_t = \sum_{i=1}^{k-1} \Gamma_i \Delta y_{t-i} + \alpha_0 + \alpha_{1t} + \mu \delta Y_{t-i} + \varepsilon_t \ldots \quad (4)$$

Where:
Δy_t = $Y_t - Y_{t-1}$
k – 1 = lag of VECM and VAR
α_0 = intercept vector
α_1 = Regression coefficient vector
μ = loading matrix

δ = cointegration vector

$\mathcal{E}_t$ = error vector with nx1 dimension

δ as cointegration vector is important due to show if there is a cointegration among of estimated variables.

This research utilizes ADF test to check stationary data with null hypothesis that the data are not stationary (consist of unit root). If ADF statistic is lower than Mc. Kinnon Critical Value, then the null hypothesis is rejected and it can be concluded that those series data are stationary. Afterward, the model needs to check its lag. In this research, the decision to choose the optimum lag is based on five criteria: (1) *Likelihood Ratio* (LR), (2) *Final Prediction Error* (FPE), (3) *Akaike Information Criterion* (AIC), (4) *Schwarz Information Criterion* (SC), and (5) *Hannan-Quinn Criterion* (HQ). This research employes 132 observations series of data.

The optimum lag is selected when the variables are on the level stage. The next major step is checking cointegration test. It shows two results, first is deterministic assumption which is used and second is the total correlation of its cointegration. Eviews 8 user's Guide II (2008) offered that in cointegration test there are five types of deterministic trend assumption, (1) the level of the data doesn't have intercept, (2) the level of the data has deterministic trends and its cointegration equation has intercept, (3) level of the data has a linear trend and the cointegration equation only has intercept, (4) the level of the data has quadratic trends and (5) the cointegration equation has a linear trend. After checking cointegration test and the result shows that there is at least one cointegration in the model, then the next step is building the VECM model.

3.2 Assumption

a) The concept and definition which are implemented in this paper in terms of variables of current account, consumer credit, investment credit, working capital credit, reserve requirement loan to deposit ratio, non-performing loan, and money supply in the two countries are assumed that they have no difference so that they are available to be compared for analysis. Though, there are existing differences which can be tolerated regarding to the accuracy result of analysis and measurement matters.

b) The other dominated factors which are not counted in the model are assumed having no valid contribution.

3.3 Framework

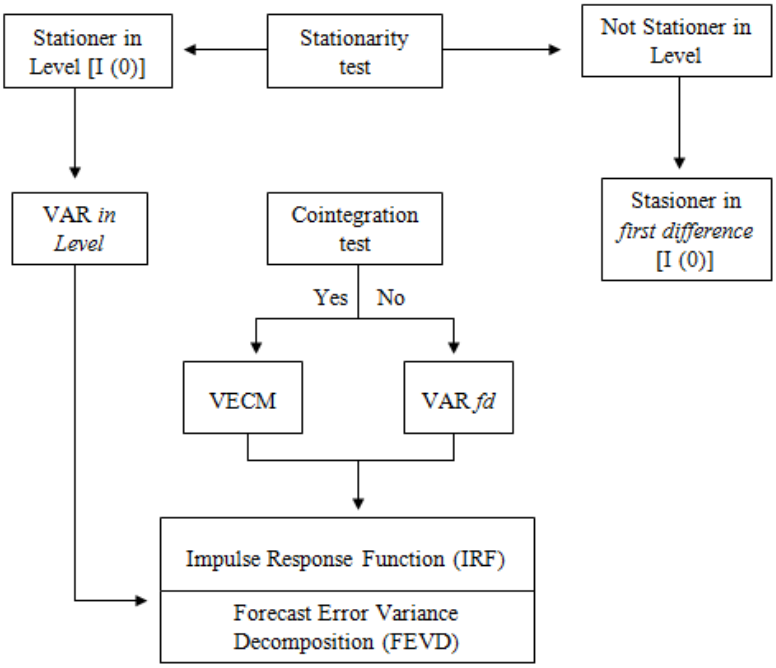

Figure 4. Research Framework
Source : [30].

4. Results and Discussion

4.1 Descriptive Analysis between China and Indonesia

4.1.1 Reserve Requirement

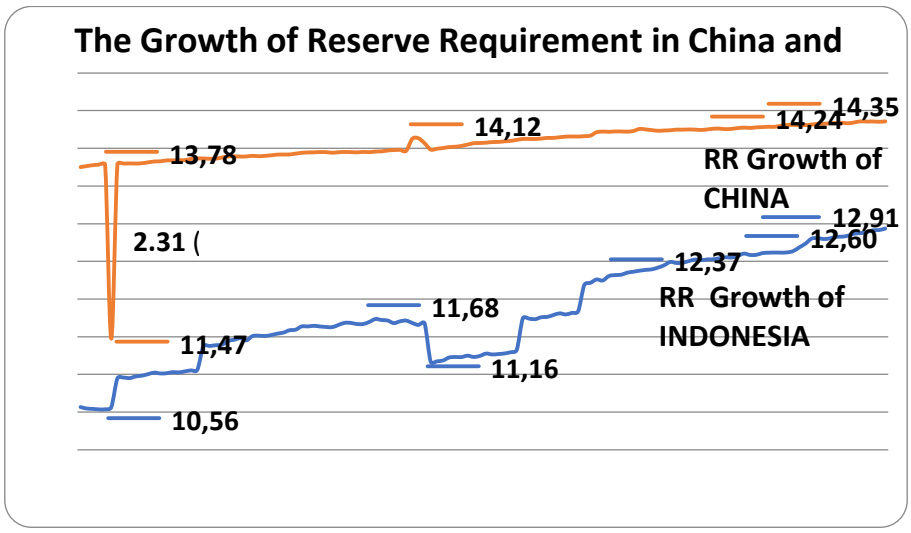

Figure 5. The Growth of Reserve Requirement in China and Indonesia (%)
Source : Bank Indonesia and People Bank of China, downloaded on October 2015

According to the figure 5, the growth of reserve requirement by common banks in Indonesia was more fluctuating than in China. There was a sharp decrease in reserve requirement decrease in China on October from about 13,7 percent to 11,5 percent. In the same year, the growth was going back to normal to

the point of about 13,7 percent and gradually rose. In 2013 to 2014, the growth of reserve requirement got slower, even the amount of supply increase. It was possible because the People Bank of China cut the percentage to manage liquidity in crisis period.

In Indonesia, the fluctuating change of reserve requirement occurred in 2004 and 2008 because of the changing composition of reserve requirement counting. Even it was not sharper than China's, unusual rise and drop can be found in 2004 and 2008. Since 2010, the growth of reserve requirement increased time by time which could happen because the Central Bank of Indonesia increase the percentage of reserve requirement or the deposits rise up.

Overall, Indonesia has more volatility growth of reserve requirement whereas China has a gradual increase of reserve requirement. Indonesia has changed the reserve requirement composition twice in 2004 and 2008 by including reserve requirement of loan to deposit ratio while China has changed its reserve requirement ratio about 27 times since 2006.

4.1.2 The Growth of Credit Supply

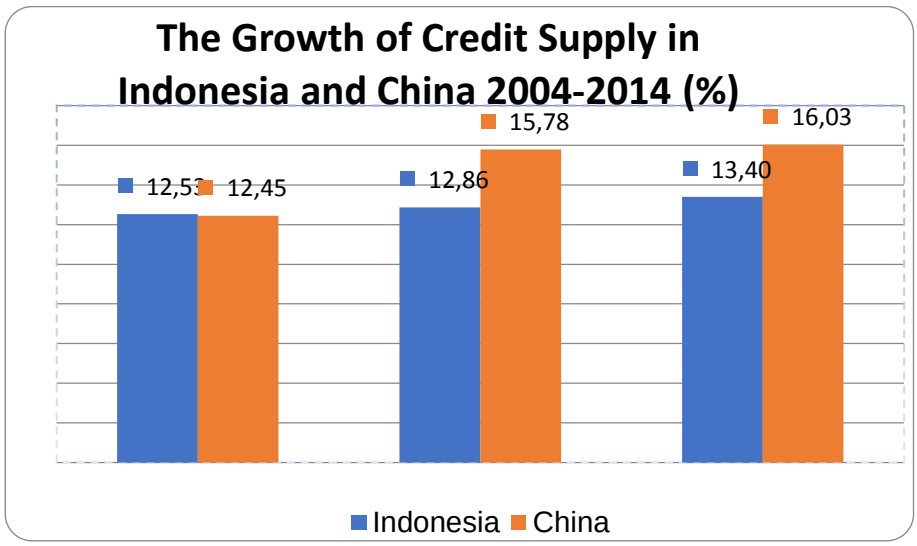

Figure 6. The Growth of Credit Supply in Indonesia and China (%)
Source : Bank Indonesia and People Bank of China

According to the figure 6, working capital credit had the highest growth of supply in Indonesia. It was close to 14 percent which was followed by consumer credit and investment credit about 12 percent. In China, working capital credit and consumer credit had a tight difference which was closed to 16 percent. As mentioned before, consumer credit is dominated by consumption for housing. Investment credit has about 4 percent lower growth of supply than the other credit in China.

To sum up, working capital credit in Indonesia has the highest growth among all of the credits which supports the establishment of real sector whereas in

China, the spending to real estate sector contributes the growth of consumer credit supply. Overall, the growth of credit in China is higher than Indonesia for all kind of credits.

4.1.3 Current Account

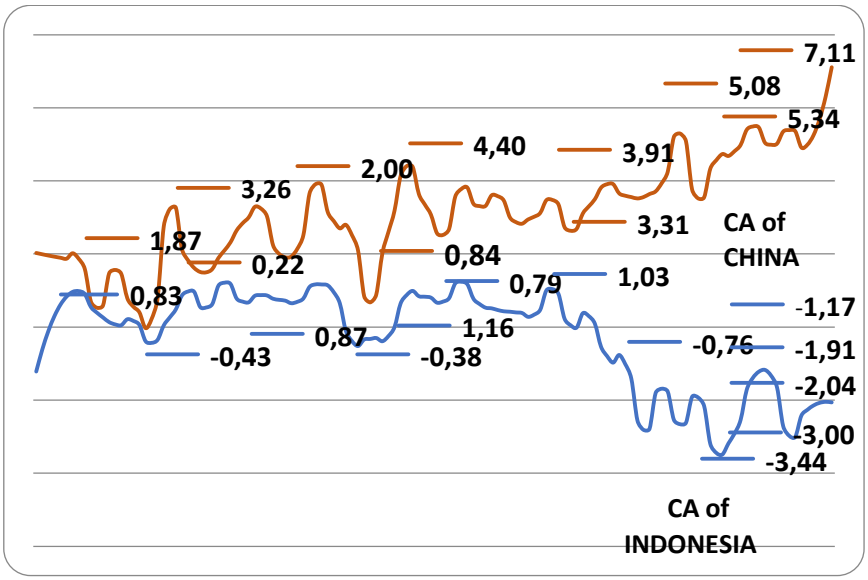

Figure 7. The Current Account in Indonesia and China (%)
Source : Bank Indonesia and People Bank of China

Figure 5 above depicts current account in Indonesia and China. As the representation of total output in a country, there was a deficit in Indonesia current account since 2011 which showed that the import was higher than the export. It also indicated that the amount of output by this country was low. Meanwhile, as the biggest exporting country in the world, current account of China was surplus. It increases time by time even though there was a deep decrease in 2008 when U.S crisis was existing. From 2004 until 2011, current account of China and Indonesia had the same pattern which was followed by an increase in China's current account and a decrease in Indonesia's current account in the next periods.

4.2 Time Series Analysis

4.2.1 The Growth of Consumer Credit Supply

Table 2. VECM Analysis of Indonesia's Consumer Credit in short term

D(LNCC)	Lag 1	Lag 2
D(CA)	-0.007694	-0.000553
D(LDR)	-0.000608	-0.000181
D(NPL)	0.013654	-0.009478
D(LNM2)	-0.127945	-0.181703

D(LNCC)	Lag 1	Lag 2
D(LNIC)	-0.047244	-0.105869
D(LNCC)	-0.602067*	-0.285154*
D(LNWCC)	0.047352	0.187229*
D(LNRR)*	0.065187	
R-Squared	0.476180	

Based on Table 2, the growth of consumer credit is affected by working capital credit in the second lag and the change of reserve requirement. Working capital credit signs that there is an effort in a country to create output. The added output pushes either the citizens to be more consumptive or the bank to offer the consumer credit and raises the consumption credit supply. The reserve requirement also gives impact to consumer credit supply. In Indonesia, instead of decreasing the consumer credit supply, the increase in reserve requirement will lead the consumer credit supply to increase because of its lower risk which is utilized by the bank to accomplish the minimum target of loan supply by the government.

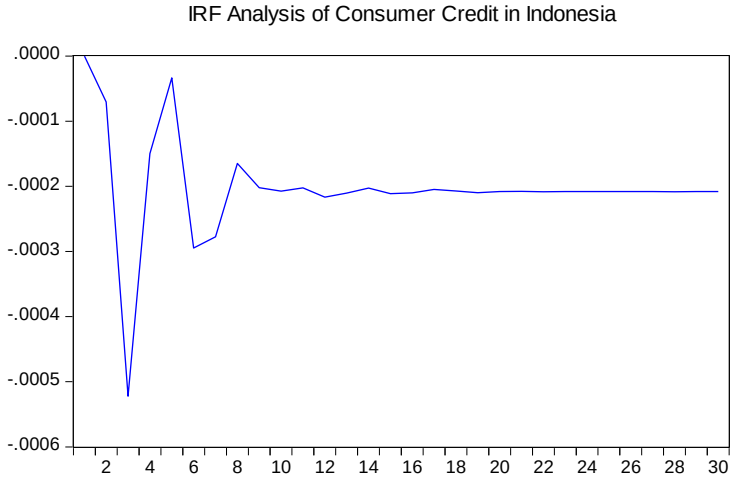

Figure 8. IRF Analysis of Consumer Credit in Indonesia

According to IRF analysis. response of the growth of consumer credit supply to the shock of working capital credit is positive. The response can be obeserved in the second period with positive response until the end of observation period. The positive response means the one standard deviaton shock of change in working capital credit will increase the growth of investment credit supply. The long term equilibrium is reached on the 39th month.

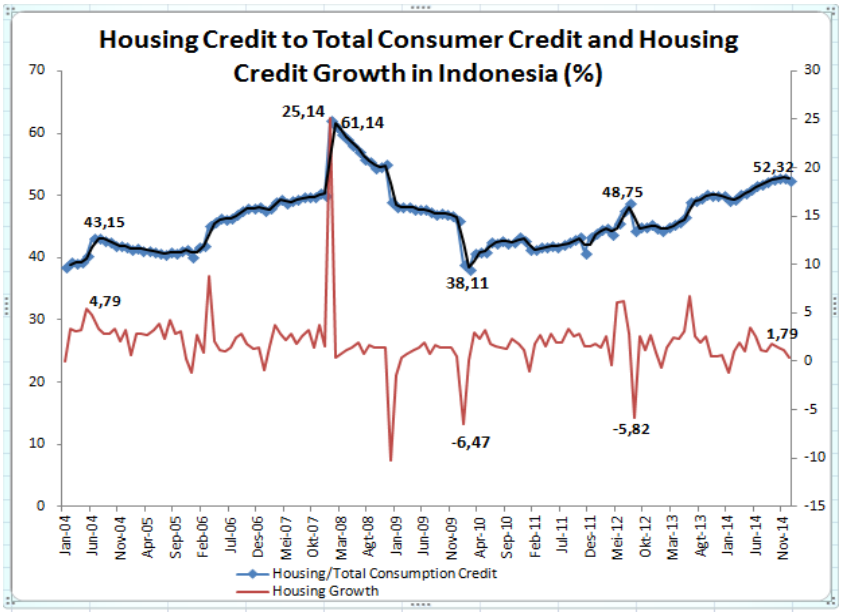

Figure 9. IRF Analysis of Consumer Credit in Indonesia

Source : Bank Indonesia (Central Bank of Indonesia), downloaded and calculated by authors, 2015

The proportion of credit supply for housing to total consumer credit was fluctuating. The highest percentage of housing credit to total credit occurred in January 2008 of about 62 percent. In 2008, the composition of reserve requirement supply was changed by Bank Indonesia. The decrease of the proportion of credit supply for housing can be found in 2009. In January 2010, the lowest percentage of housing credit per total credit is about 38 percent. The real estate bubble was tried to be solved by tightening the monetary policy, one of the instruments was reserve requirement ratio to create a procyclical behaviour for the bank in order to supply consumer credit. Moreover, the growth of housing credit was such in line with the trend of the proportion housing credit to total consumption credit. At the end of observation period, the growth of housing credit was likely the same with the begin of observation period about less than 5 percent.

Table 3. VECM Analysis of China's Consumer credit in short term

D(LNCC)	Lag 1	Lag 2
D(CA)	0.000501	0.001291*
D(NPL)	0.002615	0.005186*
D(LNCC)	0.013262	-0.287330*
D(LNWCC)	-0.009384	-0.64624*
D(LNRR)	-0.002531*	

The growth of consumer credit supply is affected by current account, Non-Performing Loan (NPL), working capital credit, and reserve requirement. Current account and working capital credit support the rises of the consumer credit supply

growth by the increase of output which is resulted by the surplus in current account and the increase in the growth of investment credit supply. Reserve requirement affects the growth of consumer credit supply by its increase which can be decreased by the amount supply of consumer credit. This statement is also supported by the research which has been done [20] in China. It is such in line with the previous research who found that there has been a long-term and stable relationship between monetary policies and housing prices which will affect the demand of consumer credit [31].

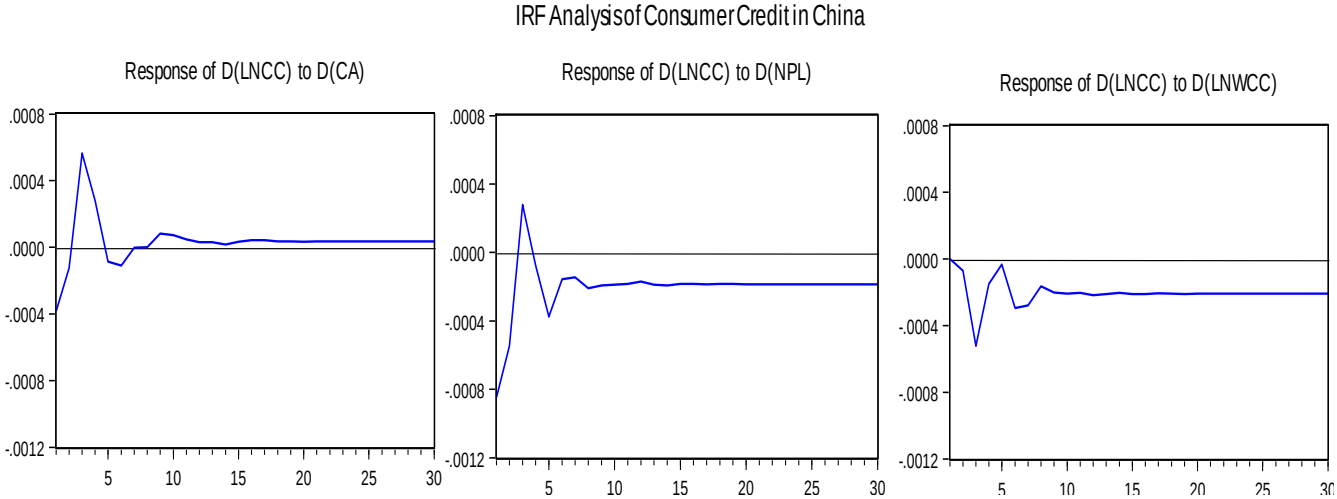

Figure 10. IRF Analysis of Consumer Credit in China

The growth of consumer credit responds the shock of change in current account and the growth of working capital credit positively. These positive response means their shock about one standard deviation will create an increase in the growth of consumer credit supply. The growth of consumer credit supply reaches its steady trend in response the shock of current account and the growth of working capital credit supply in the 38th and 22nd month. The shock of change in non performing loan creates a negative response to the growth of consumer credit which means that the shock will decrease the growth of consumer credit supply. This negative response is still going on until the end of observation periods and the growth of consumer credit supply reaches the equilibrium by the change in the 28th month.

Table 4. FEVD Analysis of China's Consumer credit in short term

Period	D(CA)	D(LNM2)	D(LNCI)
1	100	0	0
24	60.18576	25.00927	10.78861
48	58.55321	26.13780	11.19772
72	57.96819	26.53063	11.34011
96	57.66716	26.75035	11.41975
120	57.48372	26.87716	11.46572

The FEVD analysis shows that in the first year, the current account has the highest percentage in order affecting itself about 100 percent. Meanwhile, the money supply and the growth of investment credit supply affect the current account about 26 percent and 10 percent respectively in the second year as the decrease of the effect of current account to itself to be about 60 percent. The domination of current account is lowered year by year and stuck in the 57 percent since the 3rd year to the 10th year. This circumstance is still the same until the end of the 10th year.

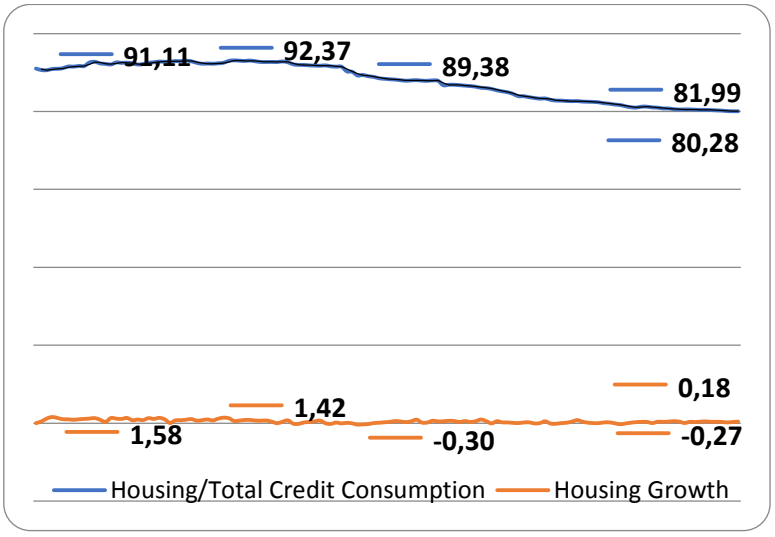

Figure 11. Housing Credit to Total Consumer Credit and Housing Credit Growth in China (%)
Source : People Bank of China, downloaded and calculated by authors, 2015

Percentage of credit supply for housing to total consumer credit tends to decrease. The highest percentage of housing credit to total credit occurred in January 2007 of about 93 percent. The implementation of expansionary monetary policy is one of the causes which supports the high increase in proportion of housing credit to total consumption credit [32]. The banks were encouraged to extend mortgage loans for first housing at only 70 percent of the benchmark rate since the fourth quarter of 2008.

The minimum down payment for the first home and second home were lowered by the People Bank of China. The decrease of the proportion of credit supply for housing can be found in 2009. The government started to realize the real estate bubble and raised the minimum down payment for the second home to 50 percent. Besides that, the reserve ratio has been raised multiple time. Meanwhile, the growth of housing credit is such in line with the trend of the proportion of housing credit to total consumption credit. At the end of observation period, the growth of housing credit is less than 0.5 percent.

4.2.2 Current Account

Table 5. VECM Analysis of Indonesia's Current Account in short term

D(CA)	Lag 1	Lag 2
D(CA)	-0.061982	0.248655*
D(LDR)	-0.027084*	-0.011552*
D(NPL)	0.152568	-0.058538
D(LNM2)	3.650937	3.606018
D(LNCI)	-2.409593	1.390321
D(LNCC)	1.183427	1.096808
D(LNWCC)	-1.847226	-2.355028
D(LNRR)	0.286765	
ECT	-0.236101	
R-Squared	0.268553	

Table 6. VECM Analysis of Indonesia's Current Account in long term

D(CA)	Lag 1
D(LDR)	-0.160022*
D(NPL)	0.247095
D(LNM2)	-16.40403*
D(LNCI)	-7.227833*
D(LNCC)	10.15306*
D(LNWCC)	4.111168
C	0.152648

According to the regression with VECM analysis, current account is affected significantly by Loan to Deposit Ratio in the first and the second lag. The short-term equation has a significant correction term so that the long-term equation is available to be explained. In the long-term Loan to Deposit Ratio, money supply, investment credit, and consumer credit have a significant effect towards change of current account. The probable reason for that is the investment activities which are correlated to loan supply that will provide an impact to the positive or negative change of current account.

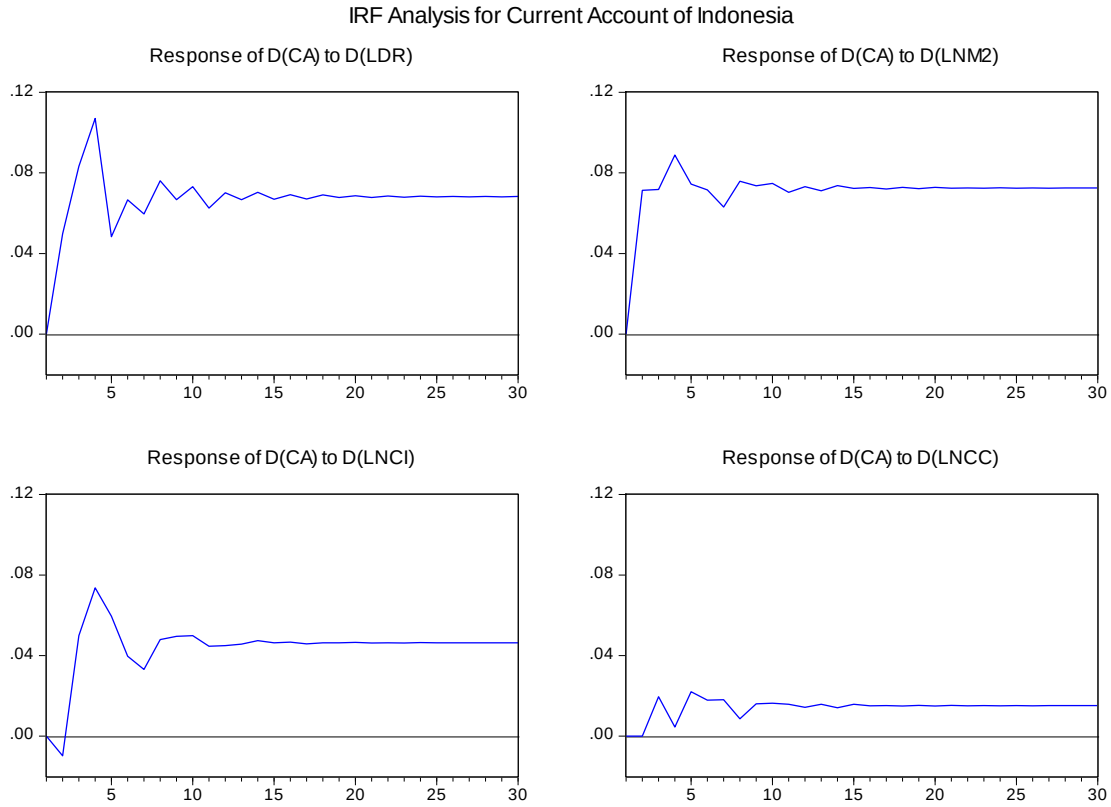

Figure 12. IRF Analysis for Current Account of Indonesia

According to IRF analysis on the first month, the shock of about one standard deviation by Loan to Deposit Ratio (LDR), money supply, investment credit, and consumer credit do not get any significant response from current account. Starting from the 3rd month, all of the variables are responded positively by current account which means that their shocks create an increase of current account. The positive responses from those variables are remain the same until the end of observation periods. The long-term equilibrium of current account in responding the shocks of Loan to Deposit Ratio (LDR), money supply, investment credit, and consumer credit are reached in the 53rd month. 46th month. 42nd month and 45th month respectively.

Table 7. VECM Analysis of China's Current Account in short term

D(CA)	Lag 1	Lag 2
D(CA)	0.253627*	0.448341*
D(LNM2)	0.339571*	0.164943*
D(LNCI)	0.230479*	0.088907*
D(LNCC)	-2.60583	-2.464741
D(LNWCC)	4.451628	1.895366
D(LNRR)	-0.029778	
ECT	0.592021*	

Table 8. VECM Analysis of China's Current Account in long term

D(NTB)	Lag 1
D(NPL)	-0.147355
D(LNM2)	0.235319
D(LNCI)	1.005948*
D(LNCC)	13.92469
D(LNWCC)	3.796684

According to the estimation, current account is affected by money supply both in the lag 1 and lag 2. Besides that. the growth of investment credit supply affects the current account in the lag 1 and lag 2. It means that the change of the growth of investment credit supply and money supply will be responded by current account after one until two months since the first change occurred. The error correction term of the current account equation is significant so that the long-term equation is able to be explained. In the long term, the current account is only affected by the growth of investment credit supply. It can happen since this kind of credit is employed in investment activities which is an important component in the current account balance sheet.

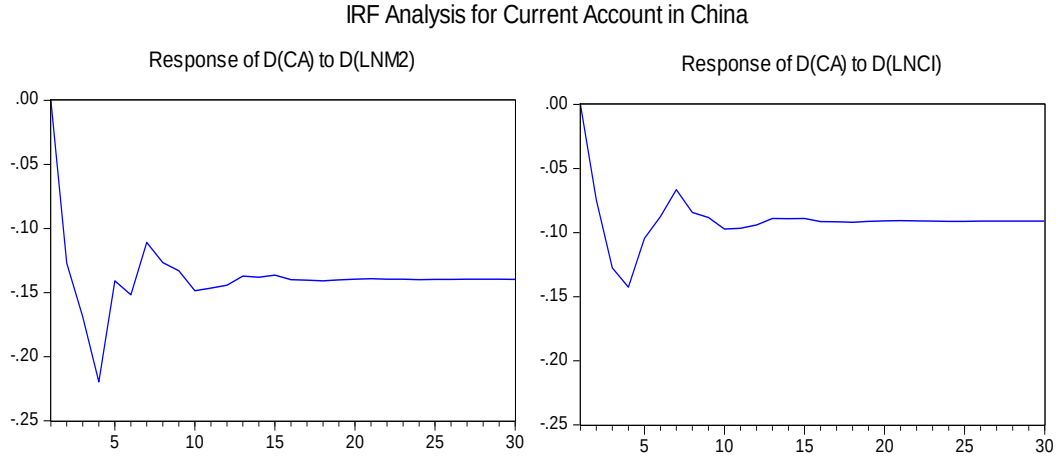

Figure 13. IRF Analysis for Current Account in China

According to the IRF analysis, the shock of about one standard deviation by money supply is responded negatively in the first month by the current account. This negative response is remain the same until the end of observation period which means that the shock of money supply change creates a decrease in the current account. The balance of the current account is easier to reach if the economy including the amount of money supply is under the control. The shock of change in money supply causes instability in the balance sheet of current account. The shock of the growth of investment credit supply is also created negative response by current account. This negative response is observed until the end of observation period. The current account reaches its long-term equilibrium in responding the change of money supply and investment credit supply growth in 44th and 45th respectively.

The current account in both countries are affected by investment credit and money supply. It indicates that investment and money supply still have important role to the amount of output in these countries. It is in line with Keynes theory about liquidity preference (1936) which stated that the money supply has impact to the total output of a country and keynessian cross which is said that investment affects the total output. The recent research about it was done by Bernanke (1992) in the United States which shows that both money supply and investment credit have impact to the economic growth as representative measurement of total output.

CONCLUSION

5.1 Discussion

Referring to the VECM analysis, as an exogenous variable, the change of reserve requirement affects the investment credit of Indonesia, consumer credit of China, and working capital credit of Indonesia in the short term. Meanwhile, the working capital credit growth affects the consumption credit growth both in China and Indonesia.

Moreover, the proportion of credit supply for housing to total consumer credit in China is higher than the proportion in Indonesia. The range percentage of the housing credit proportion in China to total consumer credit is about 80 percent to 95 percent, while in Indonesia is about 40 percent to 60 percent. Both countries were having a real estate bubble in the middle of 2008. The growth of housing credit in Indonesia is higher about 5 percent than the growth of housing credit in China which is about 0.5 percent at the end of observation period.

Furthermore, the current account of Indonesia in the short term is affected by the growth of loan to deposit ratio with adjustment speed of about 23.6 percent. In the long term, the current account is affected by the growth of investment credit, consumer credit, and money supply. As short period credit, the working capital credit does not affect the current account in the long term. In China, the current account is affected by the growth of investment credit and money supply with adjustment speed of about 59,2 percent while the only variable which is significant in long term to current account of China is the growth of investment credit.

5.2 Policy Recommendations

The central bank is expected to create a supportive policy to push an increase of total output. Based on the analysis above, the total output can be more supported by the growth of investment credit supply than the growth of consumer credit supply. However, China needs to establish a package of monetary policy which can handle the real estate bubble. The reserve requirement is such a traditional policy so that the effect on handling the housing credit demand.

Moreover, in order to manage the real sectors to create a higher quality of economic growth, the central bank is aimed to regulate the common banks as

intermediate institutions to supply more investment credit than consumer credit which are still being prudent of its liquidity. The supply of investment credit which is higher than the consumer credit will educate the citizens to do investment instead of being consumptive; therefore, the economic basis in emerging countries can be stronger as it is more independent out of the foreign factors. In addition, even though the reserve requirement is utilized as monetary instrument, the use of this tool needs to reconsider about the growth of credit supply especially for investment credit supply which is expected as funding resource for investment.

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