IMPACTS OF BUSINESS CYCLE AND MACROECONOMICS FACTORS ON NON PERFORMING BANK LOAN IN INDONESIA

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Abstract: The aim of the study is to investigate the impacts of business cycles and other macroeconomics factors on Non Performing Bank Loan in Indonesian banking industry during period 2001-2016. Using the secondary aggregate macro data of 119 commercial banks in Indonesia obtained from Bank Indonesia and BPS databases, a multiplier time series regression model was applied by using Robust Least Square to examine the effect of GDP, interest rate, exchange rate, Credit/GDP ratio, Third Parties Fund, Unemployment and Credit on Non Performing Banking Loan. The main findings is that business cycle and unemployment are the most dominant and significant factors affecting the upward or downward of Non Performing Bank Loan besides interest rate. Foreign exchange rate has no impacts at all on Non Performing Bank Loan (NPLs) as most domestic bank credit is in local currencies whereas previous one year credit extended and third parties funds have weak impacts on NPLs. During the period of expansion economics condition in the country, the NPL is procyclical with the business cycle. NPL will decrease as GDP increased but during economic 'shock' in 2004-05 the trend is reversed. NPL will countercyclical with business cycle. NPL will increase as GDP increased. We may hypothetically said that if the ' economic shock' is sourced internally due to government fiscal/monetary policy i.e. increase fuel price by the government, the impacts of business cycle tend to be countercyclical to NPL or having positive correlation whereas if the 'economic shock' come from abroad or external, the impact is procyclical or having negative correlation.

Key words: Business Cycle, GDP, Non-Performing Banking Loans, Unemployment, Credit Extended, Interest rate, Exchange Rate, Financial Fragility, Third Parties Fund.

1. INTRODUCTION

Banking industry dominates the financial system in Indonesia with portion amounting almost 80 per cent of the total assets of financial institutions. (Komara Jaya, 2014). It goes without saying that the banking industry is expected to increase its contribution in the economies. The significant role of banks contributes to the large extent in the financial system and economies of the country. Macroeconomic conditions of the country as well as global economies may affect bank performance. Favorable macroeconomics conditions can provide condusive business environment for the bank which in turn boost the economic growth of the country. Unstable macroeconomics conditions as well as external shock from other countries could increase market and credit

risks of the bank which in turn deteriorating the qualities of its lending assets. Numerous of phenomenon that shows the significant correlation between loan asset performance with business cycle is well understood and interesting to be studied. Several countries even severely hit by the recession causing slowdown in terms of their real GDP.

During the past two decades Indonesia has faced several crises that lead to the slowdown or recession in its economies started in August 1997 triggered by devaluation of Thai Bath which quickly spread to other Asian countries including Indonesia which lead to Asian financial crises and latter on creating credit default for the companies having its exposures in foreign currencies which ultimately increasing the non performing loan of

the bank that lead to banking crises. Post-1998 cycles have been milder partly due to better risk management practices and partly due to the busts of these twin crises having less impact on Indonesia's economic growth. But in 2005, the significant fuel price hike increase interest rate causing significant increase in bank non performing loan. The plunge of commodities prices in 2009, decrease export revenues significantly causing troubles for debtors to settle their loan overdue which in turn increase credit risk or non performing loan of banks. Credit extended by bank was also decreased significantly causing deterioration in bank income. The business cycle impacts on banks as we have experienced in the past is sourced from global factors that affecting the GDPs of Indonesia.

According to Minsky (1992), the current financial crises is cyclical and backboned by business cycles theory (Minsky moment). Based on this theory financial institutions particularly banks and investor are aggressively extending credit or receiving credit during the expansion or 'boom' of economic state but tend to act reversely during the contraction (bust) of economics state creating high speculative action. Fluctuation of the cycle naturally is not stable or unpredictable. Minsky propose financial instability hypothesis explaining that if the agent of economics is dominated by precautionary motive agents who is able to pay all his credit, the economy will be stable but if the economy dominated by speculative agents who is not having sufficient funds to repay the credit, the condition will lead to financial crises due to increasing Non Performing Bank Loan. Crises in Indonesia can be explained using Minsky hypothesis. In 1997/1998, all big companies financial condition are in operational loss due to sharp increase in exchange rate, while most of the companies credit is in US Dollar. So based on Minsky hypothesis, the economic agents in Indonesia are mostly speculative agents which causing bankruptcy for the companies then in turn the banks.

It is hypothesized that the macroeconomic environment plays the most important role in creating Non Performing Assets and the stability of the economy (Janvisloo & Muhammad, 2013). The banks' performance in an economic downturn is thus improved only if the real economy is stabilized, to which a credible macro policy can make a significant contribution.

We are interested in explaining the impact of business cycle which in this research paper will be proxy by Gross Domestic Products (GDP) and other macroeconomics factors ranging from interest rate, unemployment rate, foreign exchange rate, credit to GDP ratio and endogenous factors such as third parties funds, and credit extended. Why we interested to study business cycle impact on Non Performing Bank Loan is mainly due to not too many research or study discussing this topic by taking Indonesian banking industry as the scope of research.

The phenomenon is that during economic 'boom' the bank tend to extend large amount of credit with less stringent restriction to achieve higher profit while during the slow down of the economies the non performing loan is increased gradually urging bank to decrease credit extended and apply restricted lending policy which in turns reduce bank income.

The table below shows the changes of Total NPL, Third Party Funds, Credits, BI Rate, Unemployment, ratio of Credit to GDP during the period of 2001-2016

Year	NPL	RGDP	BI RATE	UNEMP	CRD/PDB
2001	12.23%	3.04%	17.62%	8.10%	19.20%
2002	7.50%	4.50%	12.93%	9.06%	20.37%
2003	6.78%	4.78%	8.31%	9.67%	21.88%
2004	4.50%	5.03%	7.43%	9.86%	24.37%
2005	7.56%	5.69%	12.75%	11.24%	25.08%
2006	6.07%	5.50%	9.75%	10.28%	23.73%
2007	4.07%	6.35%	8.00%	9.11%	25.36%
2008	3.20%	6.01%	9.25%	8.39%	28.43%
2009	3.31%	4.63%	6.50%	7.87%	26.43%
2010	2.56%	6.22%	6.50%	7.14%	27.39%
2011	2.17%	6.49%	6.00%	6.56%	29.65%
2012	1.77%	6.26%	5.75%	6.14%	33.11%
2013	1.68%	5.73%	7.50%	6.25%	36.53%
2014	1.82%	5.02%	7.75%	5.94%	36.72%
2015	2.05%	4.88%	7.50%	6.18%	34.56%
2016	2.93%	5.02%	4.75%	5.61%	40.30%

Source: Published BI Statistics & BPS Report 2016

It can be seen that during this period, variables that pertain to NPL, BI Rate decrease quite significant showing that the business cycle during the past 15 years has given favorable condition /environments for banking system to reduce its Non Performing Loan and room to lower

interest rate. Besides, Credit to GDP ratio increase quite significant from 19.2% in 2001 to peak at 36.72% in 2014 showing steady growth of credit expansion by banks.

This raised curiosity and hence the need to investigate whether the decrease in Non Performing Loan in Indonesia are due to the fluctuation of business cycle and other macroeconomics factors. Second question to be answered is whether business cycle represented by GDP is the most dominant factor affecting the fluctuation of Non Performance Assets bad loan).

Henceforth, the purpose of this research is to analyze the correlation between business cycle and other macroeconomics factors with non performing loan of the bank and also to find out how these factors affect bank non performing loan. The rest of the paper is structured as follows: Section 2 reviews the theoretical background and literature reviews on macroeconomics factors and Non Performing Loan, Section 3 presents the data and methodology, Section 4 analyses the data and discusses the results, and finally, the conclusion is presented in Section 5.

2. THEORY AND REVIEWS OF LITERATURE

2.1. Business Cycle Theory

Business cycles can be characterized as fluctuations in economic activity in the form of actual real output fluctuations around potential output of the economy (i.e. the trend). (Mankiw, G. N. , 2000) The economic cycle means alternating periods of growth and decline in real output. In this case, there is changing in employment, investments, profits and other variables. In practice, the focus is on the fluctuation of the real product. Generally speaking, the business cycle is measured and tracked in terms of GDP and unemployment – GDP rises and unemployment shrinks during expansion phases, while reversing in periods of recession. The unemployment rate is usually inversely related to the growth rate of real GDP which we known as Okun's Law. When the economy is at the peak of the business cycle the economy is growing faster than normal and the unemployment rate declines. When the economy is near the trough economic growth is slow and the unemployment rate rises.

The business cycle may have a growth trend, in that case we are talking about an expansion or fall trend, when talking about a Contraction Situation when the output does not decrease, or grow, and therefore has a zero change, is called stagnation. The expansion phase is terminated by a peak of business cycle and contraction by a through. One business cycle is defined as the period during which the economy performs motion between two consecutive turning points (e.g.between the two throughs). The duration, at which the economy passes such a movement, is referred to a cycle which these points are called the "turning points". If the economy is in a phase of expansion, but the actual real output is below the potential output, we call this situation as a recovery. If it is a phase of expansion, where the actual real output is greater than potential product, we are talking about a boom. Some economists choose the designation "crisis" instead of contraction. However, others use the term "crisis" to a significant decline in real output. When the contraction lasts longer than 6 months, this situation is called the recession. Particularly strong and long recession refers to depression and a sharp contraction refers to a slump. Wherever one starts in the cycle, the economy is observed to go through four periods – expansion, peak, contraction and trough.

Business cycles are usually measured by considering the growth rate of real gross domestic product. Despite the often-applied term cycles , these fluctuations in economic activity do not exhibit uniform or predictable periodicity.

Procyclical and countercyclical are terms used to describe how an economic quantity is related to economic fluctuations. Their meanings may vary with regard to business cycle theory and economic policy making.(Abel & Bernanke, 2001).

The terms are often used loosely to describe a government's approach to spending and taxation. A 'procyclical fiscal policy' can be summarized simply as governments choosing to increase public spending and reduce taxes during an economic boom, but reduce spending and increase taxes during a recession. A 'countercyclical' fiscal policy refers to the opposite approach: reducing spending and raising taxes during a boom period, and increasing spending/cutting taxes during a recession (Alesina, Tabellini, 2005).

In business cycle theory and finance, any economic quantity that is positively correlated with the overall state of the economy is said to be procyclical. That is, any quantity that tends to increase in expansion and tend to decrease in recession is classified as procyclical. Gross Domestic Product (GDP) is an example of a procyclical economic indicator. Many stock prices are also procyclical, because they tend to increase when the economy is growing quick.

Conversely, any economic quantity that is negatively correlated with the overall state of the economy is said to be countercyclical. (Abel & Bernanke, 2001) That is, quantities that tend to increase when the overall economy is slowing down are classified as 'countercyclical'. Unemployment is an example of a countercyclical variable.(Abel& Bernanke, 2001). In finance, an asset that tends to do well while the economy as a whole is doing poorly is referred to as countercyclical, and could be for example a business or a financial instrument whose value is derived from sales of an inferior good Procyclical has a different meaning in the context of economic policy. In this context, it refers to any aspect of economic policy that could magnify economic or financial fluctuations. (Abel & Bernanke, 2001). Of course, since effects of particular policies are often uncertain or disputed, a policy will be often procyclical, counter cyclical or acyclical (indicator has no relation with the economic condition) according to the view of the one judging it. Procyclicality can also be defined as co movement of key financial sectors variables (especially credit but spread, provisions) with real variables over the economics cycles. The problem is excessive procyclicality will amplify business cycle which cause financial instability.

Conversely, an economic or financial policy is called countercyclical if it works against the cyclical tendencies in the economy. That is, countercyclical policies are ones that cool down the economy when it is in an upswing, and stimulate the economy when it is in a downturn. (Feldstein, 2002).

Keynesian economics advocates the use of automatic and discretionary countercyclical policies to lessen the impact of the business cycle. One example of an automatically countercyclical fiscal policy is progressive taxation. By taxing a larger proportion of income when the economy expands, a progressive tax tends to decrease demand when the economy is booming, thus reining in the boom (Feldstein, 2002).

PREVIOUS STUDY

Literature selected for the purpose of our study is aimed on forecasting the Non Performing Bank Assets in macroeconomics view. We aggregate all credit extended in the country.

The relationship between the macroeconomic environment and the quality of loans has been studied in the literature relating the phases of the business cycle with banking stability. The economic expansion phase is characterized by a relatively small number of bad loans, as consumers and companies have sufficient income and revenue to cover their debts in predetermined deadlines. If the expansion phase continues to exist, then the credit is granted without considering the quality of the credit extended. However, in the recession phase, an increase in bad debts it has adverse consequence. In general, theoretical models of the business cycle with a financial explicit role offer a good basis for modeling NPL because they emphasize the cyclical nature of counter credit risk and business failures (Williamson, 1987). The academic literature provides evidence to suggest a strong relationship between the NPL and many macroeconomic variables. Among factors cited by the literature as significant determinants, there are: the real interest rate, the annual GDP growth, the annual inflation rate, loans growth, the real exchange rate, the unemployment rate, Money supply (M2) etc.

Klein (2013) examines NPLs in Central, Eastern and South- Eastern Europe (CESEE) countries to determine whether NPL is driven by macroeconomic factors. Klein (2013) examined the relationship between NPL and macroeconomic factors such as change in gross domestic factors, unemployment, and inflation. Klein (2013) found a strong negative relationship between NPL and the state of the business cycle proxy by change in gross domestic product. He found that real GDP growth and unemployment are negatively associated with the NPL. Conversely, unemployment is positively related to the NPL.

Other studies include: Keeton and Morris (1985), Rinaldi and Sanchis-Arellano (2006) investigated

household non-performing loans for a panel of European countries and found that disposable income, unemployment and monetary conditions are determinants of non performing bank loans. Salas and Saurina (2006) conducted a research in Spain to identify the factors which explains the variation in non-performing loans from 1984-2003 according to the authors high interest rates, GDP growth and soft credit conditions determine the non-performing loans.

Therefore, following prior studies, we expect a negative relationship between NPL and the state of the business cycle, proxy by change in gross domestic product. A negative sign indicates NPL is procyclical with the state of the business cycle. A positive sign would indicate counter-cyclical NPL behavior. The macroeconomic environment has an impact on the assessment borrowers and their ability to have a loan. An economy in growth is favorable to an increase in revenues and a decrease in financial distress. Several empirical studies have found a negative association between NPL and real GDP growth (Salas and Saurina 2002; Fofack, 2005; Jimenez and Saurina, 2006; Khemraj and Pasha, 2009; Dash and Kabra, 2010). The justification provided in the empirical literature of this association is that higher positive level of real GDP growth habitually entails a higher level of income. This improves the capacity of the borrower to pay its debt sand contributes to reduce bad debts. When there is a downturn in the economy (slowed or negative growth of GDP) the level of bad debts will increase.

The interest rate affects also the amount of bad debt in the case of floating interest rate. This implies that the effect of interest rates should be positive, and therefore, there is an increase in the debt caused by the increase in payments of interest rates and hence the rise of non-performing loans (Bofondi and Ropele, 2011).

Fofack (2005) argues that economic growth and the real interest rate are important determinants of bad loans in the sub-Saharan African countries. He attributes the relationship between macroeconomic factors and doubtful accounts to the undiversified environment of some economies and their high exposure to external shocks.

For the Spanish banking sector, Jimenez and Saurina (2006) present evidence that the NPL ratio is explained by GDP growth, real interest rates and credit conditions. Based on their model, Khemraj and Pasha (2009) try to find the determinants of NPL in the Guyanese banking sector. They found that the real effective exchange rate (REER) has a positive effect on impaired loans. The result indicates that whenever there is an appreciation of the local currency, the NPL portfolios of credit institutions are expected to be high. Their results demonstrate that GDP growth is negatively associated to the NPL, suggesting that the improvement in GDP leads, in real economy, to decrease NPL. They also found when banks offering loans with high interest rates and lend too much are expected to acquire higher levels of impaired loans.

Among the authors, who have confirmed that adverse macroeconomic developments are associated with the increase in NPL, we can cite the example of research conducted by Nkusu (2011).The latter, studied the feedback between NPL and macro-economic determinants in a panel vector autoregressive (PVAR). According to this author, the NPL have a central role in the relationship between credit market frictions and macro-financial vulnerability. Adebola *et al.* (2011), explore the factors that explain the NPL of Islamic banks in Malaysia for the period from 2007 to 2009. They employ the ARDL (Auto-Regressive Distributed Lag) to examine the effects of certain macroeconomic variables including the industrial production index, the interest rate and the index of producer prices. The results indicate long-term relationships between variables and note that the interest rate has a significant positive long-term impact on bad loans. The producer prices seem to have a negative impact on bad loans.

The results of this study are similar to results of previous studies, including that of Bofondi and Ropele (2011). These authors chose to study on conventional banks in Italy. They analyzed the relationship between loan quality and nature of the borrowers. According to their analysis, the macro-economic variables can affect two different categories of borrowers, namely individuals and businesses.

Bofondi and Ropele examine the macroeconomic determinants of the quality of bank loans in Italy over the period 1990Q1-2010Q2, as measured by the ratio of new NPL to outstanding loans in the previous period.

According to these authors, the Non Performing Loan is positively correlated with unemployment, interest rate and negatively co-related with GDP.

Similarly, Vazquez *et al.* (2012) were interested in the Brazilian case. They exploited a rich database that follows the evolution of bad debts by 78 banks and 21 credit categories for the period from the first quarter 2001 to first trimester 2009. They found that the procyclical behavior of loan quality depend on the type of credit. They suggest that banks with large exposures to highly procyclical credit types tend to suffer a significant deterioration in the quality of their credit portfolios in period of economic downturn.

Regarding Louzis *et al.* (2010) in the Greek banking sector, they use the method of dynamic panel data to examine the determinants of NPL for each category of loan. A set of basic macroeconomic indicators, namely, the real rate of GDP growth, the unemployment rate and the real interest rate for each loan type are studied. They used a data set of new large Greek banks for the period 2003 to 2009. The results show that impaired loans is related to the macroeconomic variables (GDP, unemployment rate, the interest rate) and to the quality of management. The NPL on mortgages are less sensitive to macroeconomic conditions.

This result is consistent with that found by Espinosa and Prasad (2010). Indeed, for a sample of 80 banks in the Golf Cooperation Council(GCC) countries in 1995 to 2008, they found that the NPL ratio arise when economic growth becomes lower, the interest rate and risk aversion increase. Their model implies that the cumulative effect of macroeconomic shocks over a period of three years is indeed important.

Concerning the case of India, Rajan and Dhal (2003) showed that the positive macroeconomic conditions and financial variables have a significant effect on NPLs of commercial banks in India. H *et al.* (2004) analyzed the relationship between the ownership structure and impaired loans of banking sector in Taiwan covering the period 1996-1999. The authors have shown that the size of banks is related to the NPL. They also found that when the portion of bank capital is owned by the state, there is a decline in non-performing loans Sinkey and Greenwalt (1991) treated the losses of banking sector in

the United States. They affirmed that the internal and external factors explain the rate of losses of these banks. These authors found a significant positive relationship between the rate of loan losses and internal factors such as excessive lending, high interest rates. Similarly, Pesola (2007) considers that loan losses are a key factor affecting the proper functioning of credit institutions. He used macroeconomics variables to explain the distribution of losses.

From the above literature, GDP, interest rate, unemployment, exchange rate, credit growth, third parties funds have been identified as economic variables that have a strong relationship with NPLs. Literature establishes and explains their relationship with NPLs as discussed below.

2.1. Interest Rate

Interest rate is one of the primary economic determinants of NPLs/bad loans (Farhan *et al.,* 2012). It is the measure of borrowed funds (Louzis *et al.,* 2012).) An increase in interest rate affects the performing assets in banks as it increases the cost of loans charged on the borrowers and reduces the borrower's capacity to pay (Ombaba, 2013). Thus, the relationship between interest rate and NPLs is expected to be positive.

2.2. Exchange Rate

The exchange rate referred to in this study is the real exchange rate defined as the price of a nation's currency in terms of another currency. A decrease in home currency will result in costly imported goods which put a pressure to finance letter of credits issued to traders by commercial banks, and thus increasing the risk of default, and vice versa (Badar & Javid, 2013). The impact of exchange rate on the NPL level is severe in countries with a high degree of lending in foreign currencies to unprotected borrowers (Turan & Koskija, 2014). Thus, a positive relationship between the two variables is expected.

2.3. GDP Growth

GDP is one of the indicators of the performance of any country's economy. The GDP referred to in this study is the real GDP, which is the macroeconomic measure of the value of economic output adjusted for price changes.

Increasing real GDP is usually associated with decreasing levels of NPLs (Beck, Jakubik & Piloiu, 2013). This is because a strong positive growth in real GDP usually translates into more income which improves the debt servicing capacity of the borrower, which in turn contributes to lower NPLs and vice versa (Khemraj & Pasha, 2009). From this literature, a negative relationship is expected between the two variables. Nevertheless, study of GDP in US shows positive relationship with NPLs.

2.4. Unemployment Rate

Unemployment rate utilized in this research is based on open unemployment rate which is defined by Central Bureau of Statistics as percentage of unemployed worker against total workforce. As defined by ILO, open unemployment consists of :

- Jobless but searching for the job
- Jobless but planning to start business
- Jobless but not seeking job as it is impossible to find the job.
- Already having job but not start working

In fact, unemployed customers cannot meet their commitments and repay the loans which can increase the level of non-performing loans. In this case, the dynamics of the two variables (growth rate of GDP and the unemployment rate) is closely related to households, companies and the ability to meet their financial obligations. An increase in GDP usually leads to greater flows of household income and a rise in profitability. An increase in the unemployment rate limits the current and future purchasing power of households and is generally associated with a decrease in the production of goods and services. Unemployment negatively affects the cash flows of households and increases the debt burden. Regarding enterprises, rising in unemployment could lead to a decline in production due to the decline in effective demand. This can lead to a decline in revenue and a fragile state debt. In this study, the results are similar to those obtained by Louis *et al.* (2010) for the case of Greek banks and Bofondi and Ropele (2011) for Italian.

In addition to the macroeconomics factors sorted from the literatures abovementioned, in this research we will add two more macroeconomics variables as below.

2.5. Third Parties Funds

Third Parties Funds refers to total number of savings, current accounts and time deposits placed by customers in the banks. Based on previous study by Beko and Festic (2008) in Hungary, a large proportion of savings is placed with banks, and savings have decelerated the NPL ratio. The mechanism is that increase in deposits/saving will increase bank capacity to lend and therefore increase LDR and in turn decrease NPL. On the contrary, in Poland, savings have accelerated growth in the NPL ratio. An increasing number of insolvent enterprises in Hungary has accelerated the NPL ratio. Huge bank losses in Hungary were the result of inadequate creditor protection and difficulties in the domestic enterprises sectors. Based on this study, we will build the hypothesis that increase in deposits or third parties funds will decrease NPL.

2.6. Financial Fragility

Post Keynesian economists define financial fragility as a process that can eventually end up in financial instability (an event). For mainstream or New Keynesian economists, financial fragility has been traditionally defined as a state in which a shock can trigger instability. Excess sensitivity to small shocks which can have large effects on prices and may lead bank to defaults. Small shocks to the demand for liquidity are always associated with large fluctuation in assets prices.(Gale, 2004).

The rapid increase in credit in an economy is now commonly perceived to be one of the leading indicators of financial instability. This view has been reinforced by the aftermath of the international financial crisis, which commenced in mid 2007 (Kelly, Robert; McQuinn, Kieran; Stuart, Rebecca, 2011).

Financial fragility is defined earlier as the ratio of debts over wealth, an assumption which finds theoretical support in the Merton (1974) model where the probability of default of a single borrower is driven by the relationship between asset value and debt face value. By extending this approach to the aggregate of debtors in the economy, the asset value is the total wealth and the debt face value is the total lending amount. This variable is built by using banks' loans as total debt and GDP as a proxy for total wealth: this variable is considered as a measure of financial fragility because the banking system

is fragile when borrowers have high debts (i.e. high loans) compared to total output. Credit is defined as all credit extended to all sectors from domestic and cross border banks for households and corporations.

The credit-to-GDP ratio is a measure that provides advanced signals of banking system stress and can be used to as part of a set of central bank policy tools to mitigate banking system risk'; It is based on work the US economist Hyman Minsky and has proved to be the best single gauge of banking risk, although the final denouement can often take longer than assumed. We will apply the Credit GDP Ratio as proxy. Financial fragility may affect NPL depending on the specific GDP value. During recession, the GDP is low, so impact of financial fragility is higher as the NPL increased.

We did not use inflation as variable in the model to be set up as the relationship between NPLs and inflation is ambiguous. Higher inflation can make debt repayment more easier either by reducing the real value of outstanding loans, or simply because it is associated with low unemployment as the Phillips' curve suggests. However, it can also weaken some borrowers' ability to repay debt by reducing real income when wages are sticky (Nkusu, 2011). Inflation may pass through nominal interest rates as lenders adjust rates to maintain their real returns or simply to pass on increases in policy rates resulting from monetary policy actions to combat inflation, thus reducing borrowers' loan-servicing capacity (Skarica, 2014).

The framework of this research is as below
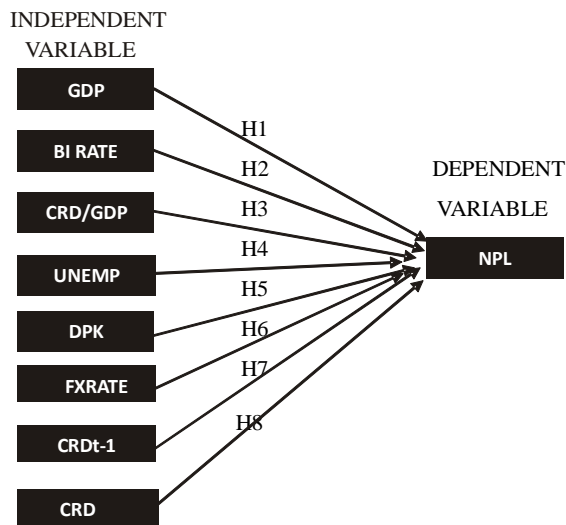
HYPOTHESIS

H1. There is a negative significant relationship between Business Cycle and Non Performing Loan

H2. There is a positive significant relationship between Interest rate and Non Performing Loan.

H3. There is a negative significant relationship between credit extended and economic Non Performing Loan

H3. There is a negative significant relationship between Financial Fragility and Non Perf. Loan.

H4. There is a negative significant relationship between Non Performing Loan and Unemployment.

H5. There is a negative significant relationship between Third Parties Funds and Non Performing Loan

H6. There is a positive significant relationship between Foreign Exchange Rate and Non Performing Loan.

H7. There is a negative significant relationship between Foreign Credit extended and Non Performing Loan.

H8. There is negative significant relationship between one year lagged Credit extended and Non Performing Loan.

3. DATA AND METHODOLOGY

The study took the form of an experimental research design that attempts to establish cause-effect relationships among the variables. It was quantitative in nature and based on secondary data. Using the macro data of entire population of 119 commercial banks in Indonesia, secondary data was obtained from Indonesian Banking Statistics and Central Bureau of Statistics databases over the period 2001-2016. The data sources were justified given the fact that data of all commercial banks were made available in Bank Indonesia report on Published Commercial Banks Financial Reports. Data collected was analyzed using Microsoft Excel and EViews 8.0.

3.1. The presentation of the Sample

We followed the majority of previous research in using NPL as the proxy of Non Performing Loan for our dependent variable. Gross Domestic Products (GDP) as the proxy of business cycle is the independent variables along with SBI or BI Rate as proxy for interest rate, Open unemployment rate (UNEMP) as a proxy for

unemployment, Third Parties Fund (DPK) as a proxy for savings, Credit Extended (CRD) as aggregate amount of credit extended and credit to GDP ratio as proxy of financial/economic fragility of the country, Foreign Exchange Rate (FX Rate) as a proxy to identify exchange rate fluctuation impacts on NPL, CRDt-1 as a proxy of one year lagged credit growth and RGDPt-1 as a proxy for one year lagged GDP.

3.2. The Model

In this section, we introduce the methodology adopted for the empirical analysis. The objective here is to estimate a relationship of each independent variables abovementioned by steps below.

Step 1: We set up simple equation or model that shows correlation of each independent variables to dependent variable individually excluding other independent variables.

$$Yt = \alpha + \beta Xt + €\qquad(1)$$

Yt = Non Performing Loan (NPL)

Xt = GDP, BI Rate, CRD/GDP, UNEMP, DPK, CRDt, FXRATE

Step 2: We set up the equation or model that shows correlation of all independent variables and dependent variable jointly.

$$NPLt = \alpha + \beta_1 \text{ BI RATEt} + \beta_2 \text{ CRD/GDPt} +$$
$$\beta_3 \text{ UNEMPt} + \beta_4 \ln \text{DPKt} + \beta_5 \ln \text{CRDt} +$$
$$\beta_6 \text{ RGDPt} + \beta_7 \text{ FXRATE} + €\qquad(2)$$

NPL and lagged Credit extended effects

Step 3: We examine the inclusion of a lagged macroeconomics variable, particularly, one-year lagged Credit Extended variable (CRDt-1) and exclude CRDt. As we know that the credit usually will not instantly become NPL within 1 year after disbursement, so we provide 1 year time to observe the credit performance. So the equation become below.

$$NPLt = \alpha + \beta_1 \text{ BI RATEt} + \beta_2 \text{ CRD/GDPt}$$
$$+ \beta_3 \text{ UNEMPt} + \beta4 \ln \text{DPKt} + \beta_5 \ln \text{CRDt-1}$$
$$+ \beta6 \text{ RGDPt} + \beta7 \text{ FXRATE} + €\qquad(3)$$

The result is reported in Table in Section 4 below. The inclusion of lagged CRDt-1 improves the explanatory power of the model. The lagged CRDt-1 coefficient is also significantly correlated with NPLs.

Regression method that we are using in this research is Robust Least Square instead of Ordinary Least Square (OLS) as based on our earlier regression results in this research, Ordinary Least Squares estimators are sensitive to the presence of outliers or observations that lie outside the norm for the regression model of interest. Based on test results, The regression also not BLUE. The sensitivity of conventional regression methods to these outlier observations resulting in coefficient estimates that do not accurately reflect the underlying statistical relationship. Robust least squares refers to a variety of regression methods designed to be robust, or less sensitive, to outliers. EViews offers three different methods for robust least squares: M estimation (Huber, 1973), S-estimation (Rousseeuw and Yohai, 1984), and MM-estimation (Yohai 1987). The three methods differ in their emphases:

- M-estimation addresses dependent variable outliers where the value of the dependent variable differs markedly from the regression model norm (large residuals).

- S-estimation is a computationally intensive procedure that focuses on outliers in the regressor variables (high leverages).

- MM estimation is a combination of S estimation and M estimation.

We will use M-estimation in our regression. Robust regression detect outliers and minimize outliers effect resulting better model compared to Ordinary Least Square which is sensitive to outliers (Rousseeuw, P. J., *A. M. Leroy, 2003).* By using Robust Least Squares we do not need to delete or exclude the outlier observations as we usually do in forming OLS model because outliers observations is usually significant to be included in our data analysis (Detail explanation and illustration on how to apply Robust Least Square by utilizing E Views is attached in this research paper).

4. EMPIRICAL RESULTS AND ANALYSIS

The regression results is summarized in table below

Aswin Rivai and Ersa Wahyuni

Factors affecting Non Performing Loan (NPL)

	Model-1	*Model-2(OLS)*	*Model- 3 (OLS)*	*Model-3(Robust LS)*
BI RATE	0.803040 ***	0.264043	0.132147	0.284683 ***
	(0.0000)	(0.1688)	(0.5595)	(0.0000)
CRD/GDP	-0.288143 ***	0.012805	-0.000306	-0.086671 ***
	(0.0109)	(0.9245)	(0.9982)	(0.0000)
ln DPK	0.037875 ***	0,14536	0.107118 *	0.250929 ***
	(0.0001)	(0.1403)	(0.1079)	(0.0000)
UNEMP	**1.043899** ***	0.555442	1.290196 *	**1.780161** ***
	(0.0089)	(0.20213)	(0.0914)	(0.0000)
ln CRDt-1	-0.027356 ***		-0.127738 *	-0.169515 ***
	(0.0000)		(0.0895)	(0.0000)
CRD	-0.028539 ***	-0.113370		
	(0.0000)	(0.1113)		
RGDP	**-2.182135*****	0.499085	**-1.575238****	**-1.592403** ***
	(0.0048)	(0.3889)	(0.0278)	(0.0000)
FXRATE	-0.00000131	0.000000293	-0.00000277	-0.00000436***
	(0.1603)	(0.9483)	(0.5142)	(0.0000)
R2	See attachment	0.945720	0.949889	0.790545
Adjusted R2	See attachment	0.901600	0.906043	0.998892
F Statistic	See attachment	20.63414	21.66638	4167.888
Probability(Fstat.)	See attachment	0.000160	0.000134	(0.00000)

***Significant at 1% ** Significant at 5% *Significant at 10%

( ) is probability or significance of the coefficient value

4.1. Interpretation and Discussion

Based on Model 1 in which each variables are regressed individually by excluding other independent variables, we found that the coefficients of Third Parties Fund (0.03877), one year lagged Credit extended (0.027969) and Foreign Exchange Rate (0.07192) are not significant even though these variables are closely correlated with NPLs. Latter on when we regress all variables jointly and replace one year lagged credit extended with credit extended, the explanatory power and the precision of the model is improved, also in line with the extant business cycle theory and strengthen previous study results.

In order to discuss the results, previous empirical and theoretical evidences were referred to. The results are discussed in line with the study objectives.

4.1. Business Cycle (GDP)

The first objective of the study was to investigate the effect of business cycle (GDP) on NPLs. Regression

analysis results revealed negative and very significant relationship between business cycle and NPLs (â-value = –1.592403, p = 0.0000). These regression results are the same as our earlier hypothesis as well as prevailing business cycle theory and previous study by Klein (2013), Khemrad and Pasha (2009) which showing the strong significant negative correlation between business cycle and NPL. A negative sign indicate that NPL is procyclical with the state of the current business cycle.

In 2005 the phenomenon is in contrary with our hypothesis or theory. GDP increased significantly from 5.05% in 2004 to 5.69% in 2005 which theoretically NPL will decreasing. But instead of decreasing, the NPLs increased from 4.5% in 2004 to 7.56% in 2005. This rapid increase contributed partly by 'shock' sourced from more than 20% hike in fuel price in October 2005 which increase production costs and boost credit demand. As a results BI Rate increase significantly to normalize the credit growth and in turn banks credit interest rate also increase which burdened companies to repay their loan

on time resulting the increase in NPL. So we can conclude that during the period of expansion economics condition in the country, the NPL is procyclical with the business cycle. NPL will decrease as GDP increased but during economic 'shock' the trend is reversed. NPL will countercyclical with business cycle. NPL will increase as GDP increased.

Another phenomenon/ 'shock' was on year 2009, GDP decreased from 6.01% in end of 2008 to 4.63% in end of 2009 due to the sharp decline of world market commodities prices of which tightening the country liquidity system and NPL was slightly increased from 3.2% in 2008 to 3.31 % in 2009. But this 'external global shock' can be explained by the business cycle theory. NPL increased as GDP is decreasing or NPL is procyclical with business cycle.

Based on the above facts, we may hypothetically said that if the 'economic shock' is internally due to government fiscal/monetary policy i.e. increase fuel price by the government, the impacts of business cycle tend to be countercyclical to NPL or having positive correlation whereas if the 'economic shock' come from abroad or external, the impact is procyclical or having negative correlation.

4.2. Interest Rate

The second objective of the study was to investigate the effect of interest rate on NPLs. Regression analysis results revealed positive and significant relationship between interest rate and NPLs (β-value = 0.284683, p = 0.0000). These regression results are also the same as our earlier hypothesis as well as prevailing business cycle theory and previous study by Ombaba (2013), Fofack (2005), Jiminez and Saurina (2006) indicating that the increase in interest rate will increase NPL. In 2005 BI Rate increase to 12.75% from only 7.45% in 2004 resulting increase in NPLs from 4.5% in 2004 to 7.56% in 2005. This rapid increase contributed partly by 'shock' sourced from more than 20% hike in fuel price in October 2005 which increase production costs and boost credit demand. As a results BI Rate increase significantly to normalize the credit growth and in turn banks credit interest rate also increase which burdened companies to repay their loan on time resulting the increase in NPL.

4.3. Financial Fragility (CRD to GDP ratio)

The third objective of the study was to investigate the effect of financial fragility on NPLs. Regression analysis results revealed negative and weak relationship between financial fragility and NPLs (β-value = - 0.086071, p = 0.0000). Based on this results, it shows that the financial fragility in Indonesia has minor impacts on Non Performing Loan. This is probably due to the low Credit/GDP ratio in Indonesia. Based on statistical data the Credit GDP ratio on 2016 is only 35.6% which is relatively small compared to peer countries Malaysia 124.1%, Thailand 147.4%, Turkey 70.3%. So there is still more room for credit to growth in Indonesia to support the country economies.

4.4. Unemployment

The fourth objective of the study was to investigate the effect of unemployment on NPLs. Regression analysis results revealed positive and very significant relationship between unemployment and NPLs (β-value = 1,780161, p = 0.0000). These regression results is the same as our earlier hypothesis and earlier study by of Bofondi and Ropele (2011) and Louzis *et al.* (2010) which found positive significant positive between unemployment and NPLs. As mentioned earlier, an increase in the unemployment rate limits the current and future purchasing power of households and is generally associated with a decrease in the production of goods and services. Unemployment negatively affects the cash flows of households and increases the debt burden. Regarding enterprises, rising in unemployment could lead to a decline in production due to the decline in effective demand. This can lead to a decline in revenue and a fragile state debt.

4.5. Third Parties Funds

The fifth objective of the study was to investigate the effect of third parties funds on NPLs. Regression analysis results revealed positive and quite significant relationship between third parties funs and NPLs (β-value = 0.250929, p = 0.0000). These regression results is the same as our earlier hypothesis and earlier study by Beko and Festic (2008) in Hungary founding that increase in third parties funds or a large proportion savings placed with banks,

have decelerated the NPL ratio. As mentioned earlier, the mechanism is that increase in deposits/saving will increase bank capacity to lend and therefore increase Loan to Deposit ratio (LDR) and in turn decrease NPL.

4.6. Foreign Exchange Rate

The sixth objective of the study was to investigate the effect of foreign exchange rate on NPL. Regression analysis results revealed negative and very weak relationship between foreign exchange rate and NPLs (β-value = 0.00000436, p = 0.0000) . We may conclude that fluctuation of foreign exchange rate has no impact on NPLs during the period 2001-2016. After the financial/banking crises in 1997 banks are very strict in extending credit in US Dollar or other currency to avoid currency risk. Since 2001 the bank portfolio/ credit in foreign currency decrease significantly. For example, the credit extended by Bank Mandiri Tbk based on financial report 2016, only 16% in foreign currencies, and the rest is in Rupiah. For Bank BRI Tbk, credit extended in foreign currency is only 9%, and the rest is in Rupiah. For BCA, credit extended in foreign currency is only 6.4% and the rest is in Rupiah. The same trend also apply with other banks. Henceforth, it is proven that fluctuation foreign exchange rate has no impacts on upward and downward trend of NPLs.

4.7. Credit Extended

The seventh objective of the study was to investigate the effect of one year lagged Credit extended on NPL. By utilizing Model 2, regression analysis results revealed negative insignificant relationship between Credit Extended and NPLs (β-value = 0.113370, p = 0.1113) . We may conclude that fluctuation of current year Credit extended has minor impact on NPLs during the period 2001-2016.

4.8. One Year Lagged Credit Extended

The eight objective of the study was to investigate the effect of one year lagged Credit extended on NPL. By replacing the Credit variable with One Year Lagged Credit variable, regression analysis results revealed negative and quite significant relationship between Credit Extended and NPLs (β-value = -0.169515 , p = 0.0000) . We may

conclude that fluctuation of previous one year Credit extended has significant impact on NPLs during the period 2001-2016. As discussed earlier, we know that the credit usually will not instantly become NPL within 1 year after disbursement, so we provide 1 year time to observe the credit performance.

5. CONCLUSION AND SUGGESTION

The aim of our study is to analyze the phenomenon of the country business cycle as reflected by the upward and downward trend of the country economic growth measured by the GDP and how this economic cycle affect the Non Performing Loan of the banks in Indonesia. Besides, we also study other macroeconomics variables ranging from interest rate, unemployment, credit to GDP ratio or 'financial fragility', foreign exchange rate, credit, and third parties funds. It is also intended to ensure whether the results is in confirm with the basic theory of business cycle and concurred previous studies. Findings of our study has no deviation from evidence found by researcher overseas.

In particular, the main findings of our study is that business cycle and unemployment are the most dominant factors affecting the Non Performing Bank Loan and we also found that the increase in NPL is contributed by the increase of interest rate.

Based on our findings, we also found that during the period of expansion economics condition in the country, the NPL is procyclical with the business cycle. NPL will decrease as GDP increased but during economic 'shock' the trend is reversed. NPL will countercyclical with business cycle. NPL will increase as GDP increased.

Based on the above facts, we may hypothetically said that if the 'economic shock' is sourced internally due to government fiscal/monetary policy i.e. increase fuel price by the government, the impacts of business cycle tend to be countercyclical to NPL or having positive correlation whereas if the 'economic shock' come from abroad or external, the impact is procyclical or having negative correlation.

Other findings is that fluctuation of foreign exchange rate has no impact on Non Performing Bank Loan since most of the credit portfolio in banking system in the

aftermath of financial/banking crises is denominated in local currencies.

Financial fragility has weak impact to Non Performing Loan. Higher Credit to GDP ratio is not a prerequisite for the decline in Non Performing Bank Assets.

Our recommendation to authorities as well as decision makers in banking is both agents should remain vigilant during economic expansion period to ensure credit extended is fully secured and supported by robust risk management process and aim at minimizing NPL instead of excessive profit achievement. Qualities of credit is more important than the amount extended.

Like any research, this study has some limitations. We could also extend the study by breaking non-performing loans by type of ownership of the banks i.e. state bank, private bank, foreign bank, etc. We can use other econometric methods such as dynamic panel incorporating the lagged non-performing loans among the explanatory variables. Thus, we can measure the impact of macroeconomic shocks based on type of ownership of the banks and then measure the resilience of banks face these shocks.

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