

Gold Price as a Determinant of Non-Performing Loans: An Analysis of Malaysia

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Abstract

Purpose: This study aims to analyze the effects of gold price and Islamic interbank rate on Islamic banking non-performing loans (NPL). It's also a part of analyzing the significance of the previous literature reviews which claimed that the fiat money was inflationary bias and gold could be the best substitution to fiat money.

Design/methodology/approach: The study used the time series data of Islamic banking NPL and five macroeconomic variables over the period from 2007 until 2009 by using the method of ordinary least squares (OLS).

Findings: The preliminary findings of this study suggest the gold price, and Islamic interbank rate gives influences on the NPL and gold price do have an impact but slightly lower as compared to the exchange rate.

Practical implications: An advantage to the gold price, in which the result concludes that it did not contribute to one of the most debatable issues in the economic system. It offers an alternative for the authority (the government), that it could be a better way and choice for the survival of the economy as to execute the new model of economy by using gold as a medium of transaction.

Originality/value: This study contributes a finding on the relationship between new strategic variables, which are, gold price and Islamic interbank rate as a causal factor of Islamic banking non-performing loans (NPL).

Keywords: NPL, OLS, macroeconomics variables, gold dinar, money supply.

Paper Type: Research Paper

Introduction

From previous analysis, money supply was proven to be the factor of inflation in the economy (Meera & Abdul Aziz, 2002). Money supply means the circulation of money in the market. It regards to the exchange rate; the Malaysian Ringgit (MYR) in the economy. Due to the global financial crisis, an excess in money supply will lead the economy to recession (Ahmed, 2002). It would result to the withdrawal of foreign investment and depreciation of the currency (Ahmad, Abbas, & Bashir, 2013). Similarly, it will increase the main source of energy, which is petrol and will give effect to others such as electric tariff, transportation cost, raw material cost and would also result to a budget deficit to the country (Meera & Abdul Aziz, 2002). All these pressures on the economy translated in the inability of household and firms to repay the debts, consequently, will result in the growth of NPL (Ahmad et al., 2013).

NPL is a challenge to the banking industry. The more the NPL, the lesser the profit to the bank (Ahmad et al., 2013). Global financial crisis could not be avoided, and yet it would affect the country financially and socially (Badar & Yasmin Javid, 2013). To Malaysia, the most critical moment was in 1997 and 1998 recession. Most of the local bank has been ordered to merge in order to strengthen the capital stability (Dali, Hamid, & Alrazi, 2004; Meera & Abdul Aziz, 2002). Employer has to suspend their employee due to the crisis. The rate of unemployment became higher and people lost their job, income and depress the capability of paying the debt (Dali et al., 2004). Therefore, the rate of NPL became

higher. Meera and Aziz (2002) seen this as a disaster created by fiat money. They claimed that the fiat money was inflationary and leads to the depreciation of currency, thus, the economy will be in recession and simultaneously will give effect to the hike of NPL. They argued that gold could put the economic situation better than fiat money.

From the existing studies, it was proven that the macroeconomic variables have an impact to the growth or decline in NPL (Festić, Kavkler, & Repina, 2010). Therefore, to prove the argument of Meera and Aziz (2002), this study contributes the new variables which are gold price and Islamic interbank rate as a determinant to NPL. It aims to examine the relationship of macroeconomic variables including gold price and Islamic interbank rate to NPL. It also aims to investigate the explanatory power of gold price and Islamic interbank rate as determinants of NPL and as a comparison of impact between gold price and Malaysian Ringgit (MYR) to NPL.

This paper is divided into several sections. Section 1 is the introduction of the analysis, section 2 highlights the literature review from previous analysis, section 3 provides the explanation of variables involves, while section 4 describes the methodology of analysis, section 5 comprises the results and discussion and finally, section 6 discusses the findings and overall conclusion.

Literature on Macroeconomic Variables

From the results that have been found, most of the situations were connected with the business cycles which are during boom and during depression (Ahmad & Bashir, 2013). The macroeconomic variables show the expected trending relationships while observing the data (Ahmad & Bashir, 2013). When the economy in boom, there was a growth in credit and while in depression it was decreased. During depression, the banks were very concern on the capabilities of the borrowers due to the strict procedures comprising the high of interest rates, the shorter period of financing, the historical credit performance of borrowers and income ability of the borrowers (Ahmad et al., 2013; Quagliariello, 2007).

Empirically, the linkage of NPL and business cycle was proven (Quagliariello, 2007). Studies have been employed to show that the business cycle is positively related to economic trends, which are during boom; the NPL is low, while in depression, the NPL is high. However, the bad performance of some sectors also explains the changes in NPL. The NPL tends to increase because of the low quality of the borrowers. This type of borrower has a tendency to contribute of the hike of NPL (Quagliariello, 2007).

There were some cases that have been identified where the credit executive failure was one of the factors that ruin the banking institution by giving the loan without prior research of borrower financial background. Therefore, it leads to the hike of NPL (Podpiera & Weill, 2008).

Some researchers employed the similar macroeconomic variables such as gross domestic products (GDP), inflation rate, exchange rate, consumer price index and the unemployment rate to be tested to NPL (Jakubík, 2007; Louzis, Vouldis, & Metaxas, 2012). But the results do have a slightly different. From the discussion, it proves that the common hypotheses sometimes could not meet the same significance to all countries. It depends on the data of that particular country itself. For instance, most of the hypotheses prove that inflation, GDP and exchange rate do have a positive relationship to NPL. It means that, the increase in inflation will result in growth of NPL and similar to other variables (Ahmad et al., 2013; Nikolaidou & Vogiazas, 2013; Senaj, Výškrabka, & Zeman, 2012; Sinkey Jr & Greenawalt, 1991). But at some country, the hypotheses are rejected due to many reasons like the period of data taken and etc. In some research, there also involves unique variables such as poor management, bank size, credit expansion and market power (Senaj et al., 2012). All the variables were positively related to NPL. These prove that management conduct does influence NPL.

Some other put the role of credit manager and his/her experience would influence the bank failure. It concludes, the decision of credit manager who influenced by the personal gain and political corruption give great tendency in increasing NPL (Jakubík, 2007). This means, an assumption on their involvement by using a substantial amount of fund for their own benefit results in growth of NPL. The research also used regression analysis by using Czech Republic data, investigates the impact of GDP ratio, real effective exchange rates, unemployment rate, real interest rate and CPI towards NPL. Through the findings, it found that the real interest rate and unemployment rates lead to the decline in NPL (Jakubík, 2007). De Nicolo (2003) used GDP, exports, the output gap, oil prices, industrial production, M1, CPI, nominal exchange rate and nominal interest rates. They found that GDP, nominal interest rates and nominal exchange rate do have a high tendency to the hike of NPL.

Babihuga (2006) investigates the macroeconomic variables such as banking sector regulations and supervision, a business cycle component of GDP, terms of trade, real lending rates, unemployment and real effective exchange rate. He did a regression on the data from Asian, European and Sub-Saharan African countries. The results proved that inflation rate and real GDP have negative indicator towards NPL while others have a strong hold to the growth of NPL. A research from the data of Central Eastern European country bank used a determinant of liquidity ratio, loan to asset ratio, inverse liquidity ratio, cost income ratio, equity to asset ratio and GDP to be tested to NPL (Männasoo & Mayes, 2009). The results found that there was a positive sign on the variable of GDP and others to NPL. Louzis (2012) chooses the Greek data to be tested to NPL. The variables that involved in the model were unemployment, GDP and interest rate. From the results, it shows that have a significant impact to the hike of NPL.

The recent model that has been developed is by Festić, M., Kavkler, A., & Repina, S. (2010). They used deposit to loan ratio, foreign direct investment (FDI), loan to asset ratio, exports, net foreign assets to net asset ratio, gross fixed capital to GDP and compensation of employees. The results suggested that the increase in GDP decreases the NPL, the loan to asset ratio impacts the growth of NPL and similar to the growth of export and industrial production improves the NPL ratio.

Therefore, from the literature reviews above, this analysis develop hypotheses based on the previous research and added some new variables to be tested to NPL with the method of OLS (ordinary least square). This is to test the significance of the theory that has been made Meera and Aziz (2002). They mentioned that the gold is more stable as compared to fiat money and this argument has also been supported by other scholars (Jastram, 1977; Sanusi, 2002; Vadillo, 2002; Yackop, 2002). They claimed that the fiat money is inflationary bias and tends to give chaos to the society. In the case of inflation, people will bear the burden to pay the high debt consequently results in growth of NPL. Therefore, this study will give an empirically proof for that abovementioned argument.

There are five variables involved, which are, consumer price index (CPI), money supply (Ms), exchange rate (MYR), gold prices (Gold) and Islamic interbank rate (IIR). The hypotheses are as below:

- H₁: The increase in CPI results in growth of NPL.
- H₂: The increase in Ms results in growth of NPL.
- H₃: The increase in MYR results in growth of NPL.
- H₄: The increase in Gold results in growth of NPL.
- H₅: The increase in IIR results in growth of NPL.

Explanation of variables

From previous research, suggested that all the macroeconomic variables above have a positive influence to NPL (Ahmad et al., 2013). Therefore, below are the explanations for all the macroeconomics variables that involved in this model.

CPI: Consumer price index is regards to the price in the market. In Malaysia, it can be translated to the rate of inflation in the economy. Thus, an increase in inflation (CPI) tends to lead price of the goods in the market to increase as well. If we assume that the income is constant, therefore it will affect the ability of the borrower's debt payment. Consequently, it will create growth of NPL.

Ms: Money supply is the source of inflation crisis. Therefore, the increase in money supply tends to increase the inflation. The price in the market would also increase. Thus, it will increase the rate of NPL in the country.

MYR: Ringgit Malaysia (MYR) is greatly depending on the demand and supply in the market. Therefore, an increase in MYR means a depreciation of the Ringgit Malaysia currency in the market. Depreciation contributes to the inflation; therefore, the price of the goods in the market would also tend to increase and results in increase of NPL.

Gold: This is a contribution to this study. It is to measure the influence of gold in NPL. Assuming that the gold having as same as MYR impact to NPL. Therefore, gold would also have an influence to the growth of NPL. The increase in gold price results in the growth of NPL.

IIR: This variable also considers as a contribution to this study. Assuming that the IIR as same as interest rate impact to NPL. An increase in interest rate, will burden the borrowers to pay their debt. Therefore, the increase in IIR results in growth of NPL.

Methodology of Analysis

This study used a time series data from the year 2007 until 2009. The source of data was taken from the very credible institution in Malaysia which is Bank Negara Malaysia. The time series data involves a monthly data which total up of 36 months. This is a regression of short runs of macroeconomic variables. It is due to the data available for Islamic banking non-performing loan is just from 2007 till 2009.

This econometric analysis (Gujarati & Porter, 2009) will apply the model in log forms in order to avoid heteroskedasticity from the analysis. This process is known as a log transformation. By doing the log transformation, the data will produce an accurate result accordingly. Then, the data will be converted into differences then change it into a percentage.

The data will be checked for the stationarity by doing the unit root test. The stationarity data means that most of the data have a constant mean and variance. If this happens, it will produce to false regression analysis with high R-squared and few significant relationships between variables. Therefore the stationarity test will be conducted by Augmented Dickey Fuller (ADF), Dickey-Fuller GLS and Philips-Peron (PP) unit root test.

The variables also will be checked for the multicollinearity by using correlation matrix. This may happen due to the high correlation between all the variables involved. If this happen, it will make the significant variable insignificant by increasing the p-value; then it may lower the t-statistics value. The multicollinearity will be solved by dropping the high correlated variables then the regression will produce the best result.

After the result of OLS produced, the model will be tested into certain features. This is to prove that the model is the best fit model to the analysis. Firstly, the high R-squared value with the maximum level of confidence between variables and F-statistics value with p-value less than 5%. Secondly, residual are not serially correlated, thirdly, residual are not heteroskedasticity and fourthly, residuals are normally distributed. When the model has all the above features, it means that the model is the best fit model to the analysis.

For this analysis, the macroeconomic variables model involved is:

$$NPL_t = \beta_0 + \beta_1 CPI_t + \beta_2 GOLD_t + \beta_3 IIR_t + \beta_4 MSt + \beta_5 MYR_t + \mu_t$$

Where,

NPL_t denotes the dependent variable, in the time period 't'

CPI_t denotes the consumer price index in time period 't'

$GOLD_t$ denotes the gold prices in time period 't'

IIR_t denotes the Islamic interbank rate in time period 't'

MSt denotes the money supply in time period 't'

MYR_t denotes the Ringgit Malaysia currency in time period 't'

β_0 denotes intercept

$\beta_1, \beta_2, \beta_3, \beta_4, \beta_5$ are the respective coefficient terms

μ_t denotes the error term

t denotes the monthly time period (2007 until 2009)

Table 1: Unit root test results of macroeconomic variables

| | | ADF | ADF GLS | PP |
|-----------|------|--------------|-------------|--------------|
| Intercept | NPL | -1.254362*** | -5.318535* | -1.269216*** |
| | CPI | -1.485649*** | -3.434563** | -1.186511*** |
| | GOLD | -0.581038*** | -4.390856* | -0.609878*** |
| | IIR | -0.831970*** | -3.563274** | -0.571355*** |
| | Ms | -0.208023*** | -4.447706* | -0.208023*** |
| | MYR | -2.735671*** | -5.004167* | -1.613536*** |

Where* represents significance level of 1%,**represents significance level of 5%,***represents significance level of 10%

Table 2: Correlation matrix of macroeconomic variables

| | LNNPL | LNCPI | LNGOLD | LNIR | LNMS | LNMYR |
|--------|-----------|-----------|-----------|-----------|----------|----------|
| LNNPL | 1.000000 | | | | | |
| LNCPI | 0.797206 | 1.000000 | | | | |
| LNGOLD | 0.848335 | 0.722318 | 1.000000 | | | |
| LNIR | -0.652496 | -0.492848 | -0.811672 | 1.000000 | | |
| LNMS | 0.936794 | 0.867892 | 0.938071 | -0.756563 | 1.000000 | |
| LNMYR | 0.082195 | 0.222113 | 0.078430 | -0.514526 | 0.184877 | 1.000000 |

Table 3: OLS results of macroeconomic variables

Dependent Variable: LNNPL

Method: Least Squares

Date: 02/24/14 Time: 16:14

Sample: 2007M01 2009M12

Included observations: 36

| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
|--------------------|-------------|-----------------------|-------------|--------|
| LNCPI | -0.752541 | 0.720653 | -1.044249 | 0.3047 |
| LNGOLD | -0.607169 | 0.244378 | -2.484550 | 0.0188 |
| LNIR | -0.073559 | 0.106979 | -0.687602 | 0.4970 |
| LNMS | 2.825099 | 0.465732 | 6.065935 | 0.0000 |
| LNMYR | -0.731892 | 0.425743 | -1.719094 | 0.0959 |
| C | -20.83797 | 3.246984 | -6.417639 | 0.0000 |
| R-squared | 0.910904 | Mean dependent var | 8.490034 | |
| Adjusted R-squared | 0.896055 | S.D. dependent var | 0.141331 | |
| S.E. of regression | 0.045566 | Akaike info criterion | -3.188300 | |
| Sum squared resid | 0.062288 | Schwarz criterion | -2.924380 | |
| Log likelihood | 63.38941 | Hannan-Quinn criter. | -3.096185 | |
| F-statistic | 61.34309 | Durbin-Watson stat | 1.820763 | |
| Prob(F-statistic) | 0.000000 | | | |

Table 4:Breusch-Godfrey Serial Correlation LM Test:

Obs*R-squared 2.347428 Prob. Chi-Square(2) 0.0253

Table 5:Heteroskedasticity Test: Breusch-Pagan-Godfrey

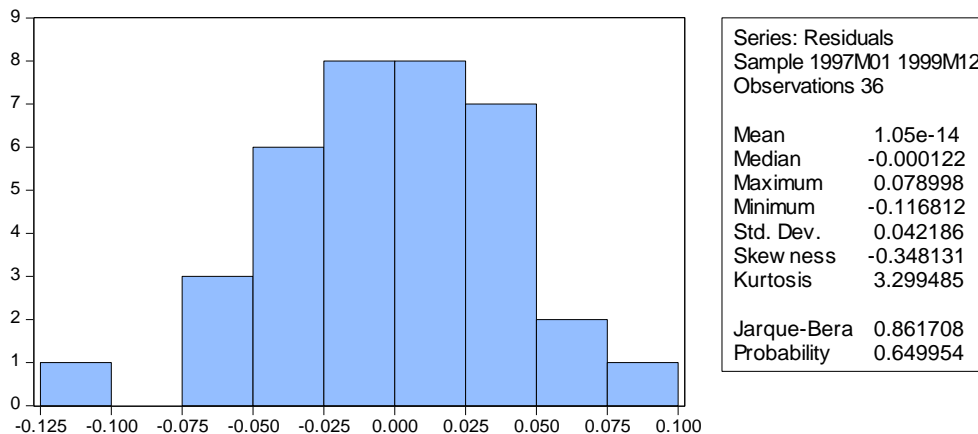
Obs*R-squared

9.725867

Prob. Chi-Square(5)

0.5834

Graph of normal distribution



Result and Discussion

The analysis of this model begins with the test of stationarity. All the variables will be transformed into percentage to capture the dynamic of the variables over the period of time. The unit root test will be used in order to check the stationarity of all the variables. From the table 1, it shows that the variables have been tested by using ADF, Dickey –Fuller GLS and PP stationarity tests. The results show that all the variables are stationary at level. Thus the OLS could be run to the further analysis.

The next step is to check the multicollinearity of variables involved. Multicollinearity should be run for the purpose of identifying the high correlation between any two exploratory variables. If this problem occurs, it will make the significant variables insignificant by increasing the p-value and will lower the t-statistics value. The correlation matrix is shown in table 2.

From table 2, the results suggest that there is no correlation between all the variables involved, therefore the model can be used for the further analysis.

Table 3 shows the results of the model. It shows that the model has a better fitted model in conducting all the variables. The R-squared gives the proof that the model has 91% (0.910904) variant in NPL and is explained by all the five variables. The F-statistics has a p-value of 0.000000 that means the model rejects the null hypothesis and suggesting that the variables involved could influence the NPL.

The results also suggested that the gold, money supply and Ringgit Malaysia (MYR) are significant to NPL while for the variables of CPI and IIR are insignificant associated with NPL.

The table 3 shows statistically significant relationship between the money supply (Ms) and NPL. It proves that the Ms really has a huge influence in NPL, where, the increase in money supply will create inflation in the market and therefore it could depress the ability of the borrower to pay their debt and the probability of NPL to hike is true. Thus, the model rejects the H_0 .

While, the negative relation between MYR with NPL prove that the model reject the finding of the existing studies that the exchange rate has significant positive to NPL. The basic theoretical for the significant positive is expected by the depreciation of MYR (an increase in MYR) tends to lead to inflation in the economy. Thus, the borrower is expected will bear the burden of the increasing price in the economy and will lower the ability to pay the debt of the borrower.

From this new finding, it can be concluded that data may vary for each country. It also justifies that NPL for the commercial bank is different from the NPL of Islamic banking. The data collected would also give some impact to the results.

By analyzing this new finding, it builds an assumption that depreciation in currency will not always give the impact of inflation and tends to boost the NPL. This also gives the signs that the currency is not the only thing to put a blame for the economic downturn. Therefore, the model accepts the H_0 and rejects the H_5 .

The results for the gold price give a meaningful justification. As a new variable, it shows that the gold did not have any influence to the NPL. It also means that gold could be the alternative currency because any increase in the price of gold did not create the growth of NPL. It also gives the impact slightly lower than MYR to NPL, where the coefficient of gold price is 0.607169 while MYR is 0.731892. If we convert it into percentage, the impact of gold to NPL is 10% lower than MYR. Therefore, the model accepts the H_0 and rejects the H_2 .

At the end of the analysis, the model will be checked for the existence of serial correlation, heteroskedasticity and normal distribution. The results of the tests are as follows:

Breusch-Godfrey serial correlation LM test was used to check whether the model was experiencing serial correlation or not. From the results in table 4, the p-value is less than 5%. It suggests that there was no serial correlation in the model.

While, the heteroskedasticity was checked by using Breusch-Pagan-Godfrey test. The table 5 shows that the p-value of the hypothesis is greater than 5%, therefore, the regression model was free from the heteroskedasticity. The result accepts the null hypothesis.

Lastly, the regression model has to be checked for the normal distribution test. The graph of normal distribution below shows the results of Jarque-Bera statistics. The p-value of Jarque-Bera statistics show that the regression model is greater than 5%, thus, the null hypothesis is accepted and suggesting that the model is normal distributed.

Conclusion

The main aim of this study is to examine the relationship between the new variables which are gold prices and Islamic interbank rate to NPL. It also included the macroeconomic variables from the previous study which are consumer price index (CPI), money supply (Ms) and exchange rate (MYR).

This study suggests three variables which are gold, Ms and MYR have influence to NPL. It also rejects the previous research where the exchange rate is positively correlated to NPL. However, the results still depend much on the source of data and the country itself. They might be varied depends on the country situation.

The only variable that rejects the H_0 is Ms, where, the hypothesis suggests that the increase in Ms results in growth of NPL. From the results, it proves that the higher the Ms contributes to inflation in the market, therefore, it will burden the borrowers in paying their debts, and consequently the NPL is high.

The argument from Meera and Aziz (2002) has been proved by this regression model where they claimed that money supply creates inflation in the economy.

While, the other two variables accepts the H_0 because of the relationship is contradicts to the hypothesis. However, the result in this regression model suggests that the previous study is not wrong but it comprised some other factors that involved in the data.

This study also suggests that the gold has a slightly low impact as compared to an exchange rate which is MYR. It proves that the gold could be considered as an alternative way in order to improve the economic situation.

The finding of this study could be helpful to the authority to consider from every single aspect either financially or socially to improve the prospect of the economy in the future.

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