Macroeconomic Implications on Non-Performing Loans in Asian Pacific Region

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Abstract: This paper uses dynamic panel data methods to examine the implications of macroeconomic indicators on the non-performing loans (NPLs) in the Asian Pacific Region. Applying annual data from 2000 through 2008 for twelve countries, the results show significant effect of interest rate (INTR), inflation (INF) and economic growth (GDP) on non-performing loan (NPLs). Specifically, the GDP is negatively affecting NPL. We posit positive coefficient since inflation will capture the effect of a less volatile price regime only in the long run. Indeed, the results shows that macroeconomic stability and economic growth are associated with a declining level of nonperforming loans; whereas adverse macroeconomic implication coupled with higher cost of capital are associated with a rising scope of nonperforming loans.

Key words: Non-performing loans • Macroeconomic implications • Dynamic panel data • Asian Pacific Region

INTRODUCTION

In last two decade, many financial institutions around the globe have faced with pertinent problem of non-performing loans, (NPL). Indeed, the world has acknowledged that the NPLs can be closely linked with Asia currency crisis in 1997 and subprime crisis in 2007. Furthermore, the non-performing loans (NPLs) have been suspected to be the main cause for the financial markets’ collapse. During the period, banks’ bad-loan problems in East Asian countries have skyrocketed and their balance sheets are fast deteriorated due to the increasing of bad loan. For example, in Indonesia alone, over 60 banks collapse during the crisis due to non-performance loans representing nearly 70% of total loan portfolio [1]. In fact, the problem arises when deregulation of financial institution is at its peak. Loan borrowings from public and private nonfinancial business sector are easily approved. The regulators fail to supervise effectively as they lack expertise in scrutinizing borrowers at banking institutions level. And even worse, political pressure and family ties are closely tied with loan approval- a financial theory related to moral hazard and crony capitalism. Hence, the default loans start to increase while the banks’ net worth decreased. Consequently, economic activities have been weakened dramatically due to the lack of funds since bank will not be able to create lending activities to spur back the economy. In the end, the global real economy is badly affected as shown during the financial crisis in Asia and the subprime mortgage meltdown in the US.

In the meantime, the rise of large economy player such as China and India in the last decade where their growth are tremendous, also contributed to high risk of rising inflation, thus, increases the risk of bank defaults due to liberal lending policy banks. Both countries have raised their Reserve Requirements (RR) many times to curb inflation. China, for example, has raised it to 14.5%, whereas, India to 7.5%. By increasing the Reserve Requirements it cuts the lending ability of the bank to a certain extent. At present to curb inflation, the interest rate are further hiked which means borrowing cost will goes up.

The aim of this study is to examine the relationship between Non-performing loans and several key macroeconomic indicators in the Asia Pacific and South Asia regions. In particular, the effect of macroeconomic variable such as interest rates, inflation rates and gross domestic product on the non-performing loans (NPLs) will be examined.

Nonperforming loans generally mean loans which for a relatively long period of time do not generate income; that is the principal and/or interest on these loans has not been paid for at least 90 days [2]. The present study will contribute to the existing literature by providing evidence
on the causes of bad loans in Asia Pacific and South Asia countries, which has been hit badly during the study period. We argue that in any economic situation, addressing the non-performing loan (NPL) issues is critical and regarded as a continuing challenge amongst financial institutions. Thus, it is should be looked into seriously by the policy makers and institutional implementers, especially in the context of managing the overall bad loan towards creating more effective and efficient institutions.

Section 2 reviews the literature. Section 3 describes the data and methodology. The main finding is presented in Section 4 with the test result from panel data GLS analysis. Section 5 is the conclusions.

**Literature Review:** Studies conducted by previous scholars have agreed on the impact of macroeconomic variables pose onto the non-performing loans. Louzis, Voulidis and Metaxas [2] use dynamic panel data methods to examine the determinants of non-performing loans (NPLs) in the Greek financial sector. They find that macroeconomic variables, specifically the real GDP growth rate, the unemployment rate and the lending rates have a strong effect on the level of NPLs.

Khemraj and Pasha [3] examine the relationship of various bank specific and macroeconomic variables as determinants of NPLs in Guyanese banking sector. Based on empirical evidence, they argued that banks charging relative higher lending rates with excessive lending strategy are exposed to higher risk of incurring NPLs. Sinkey and Greenwalt [4] also share similar view and posited that NPLs reflect realized credit risk for banks arising either from external factors such as depressed economic conditions, or internal factors such as poor lending decisions or both. They find a significantly positive relationship between the level of loan defaults and high interest rates, excessive lending and volatile funds. This indicates that when a commercial bank increases its real interest rates this may translate immediately into higher non-performing loans.

A similar study is recently conducted by Nkusu [5] who examine the macroeconomic determinants of loan defaults through panel regressions and panel vector autoregressive models. He argues that loan rates are volatility, it will cause a hike in interest rates result in deterioration of borrower’s repayment capacity and hence, cause of increase in NPLs. In addition, Kaplin, et al. [6] hypothesized a negative relationship between interest rates and Non-performing loans. The result shows there are significant negative contemporaneous correlations between the changes in short interest rates and aggregate default rates, with a particularly strong relationship around financial crises.

Rinaldi and Sanchis-Arellano [7] find that, in European countries, low levels of inflation have been associated with less volatile inflation, so that surprises are less likely to occur, thus decreasing the likelihood of falling into arrears. This argument would be more consistent in the long run given that is linked with the perceived uncertainty. In the long run there will be an adjustment of price, so the effect of the cost of borrowing is captured by the real interest rate. Inflation in the long run is capturing the effect of a less volatile price regime and therefore less uncertainty. The positive estimated coefficient, therefore, suggests that lower volatility has contributed to the better performance of the ratio of arrears.

Fofack [8] indicate that the dynamics of Non-performing loans is best explained by the growth rate of GDP. Based on panel result, the variable GDP per capita has a negative sign, a prolonged economic recession and downturns coupled with falling per capita GDP is likely to increase the scope of default on loans, especially in the most depressed sectors of the economies.

Based on economic theory, an inverse relationship exists between Non-performing loans and real GDP. Espinoza and Prasad [9] show that NPL increases during periods of low growth. This empirical results support the view that both macro-factors and bank-specific characteristics determine the level of Non-performing loans. In particular, they find strong evidence of a significant inverse relationship between real GDP and Non-performing loans. Similar result obtained by Rajan and Dhal [10] who show that during favorable macroeconomic condition measured by GDP growth and financial factors such as maturity, has negatively impacted on the Non-performing loans (NPLs) of commercial banks in India.

**MATERIALS AND METHODS**

**Data:** The yearly data for NPL, GDP, INTR and INF are retrieved from World Bank Data base and United Nations (UN) Data base. The sample observations covers the period from 2000 to 2008 and consisting twelve countries including ten selected Asian Pacific countries and two South Asia countries. The countries are Hong Kong, Korea, Indonesia, Malaysia, Thailand, Philippine, Singapore, Australia, China, Japan, India and Bangladesh.
Table 1: Descriptive Statistics

<table>
<thead>
<tr>
<th>Stats</th>
<th>npl</th>
<th>intr</th>
<th>inf</th>
<th>gdp</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>9.417</td>
<td>8.469</td>
<td>3.255</td>
<td>5.324</td>
</tr>
<tr>
<td>Max</td>
<td>35</td>
<td>19</td>
<td>13.1</td>
<td>14.2</td>
</tr>
<tr>
<td>Min</td>
<td>0</td>
<td>1.664</td>
<td>-3.76</td>
<td>-1.21</td>
</tr>
<tr>
<td>SD</td>
<td>8.470</td>
<td>4.189</td>
<td>3.163</td>
<td>2.806</td>
</tr>
<tr>
<td>CV</td>
<td>0.900</td>
<td>0.494</td>
<td>0.972</td>
<td>0.527</td>
</tr>
</tbody>
</table>

Notes: npl= Non-performing Loan, intr= Interest rate, inf= Inflation rate, gdp= Gross domestic product

Table 2: Correlation Between variables

<table>
<thead>
<tr>
<th>Correlation</th>
<th>npl</th>
<th>intr</th>
<th>inf</th>
<th>gdp</th>
</tr>
</thead>
<tbody>
<tr>
<td>npl</td>
<td>1.000</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intr</td>
<td>0.4518</td>
<td>1.000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inf</td>
<td>0.1034</td>
<td>0.6987</td>
<td>1.000</td>
<td></td>
</tr>
<tr>
<td>gdp</td>
<td>0.1188</td>
<td>0.1487</td>
<td>0.0512</td>
<td>1.000</td>
</tr>
</tbody>
</table>

Panel Data Model: The present study applies the GLS of panel data technique following structure below:

\[ y_{it} = x_{it}' \beta + z_{it}'d_{ij} + \varepsilon_{it} \]

\[ y_{it} = \sum_{j=1}^{N} \alpha_{ij} d_{ij} + x_{it}' \beta + \varepsilon_{it} \]

where

\[ d_{ij} = \begin{cases} 1 & \text{if } i = j \\ 0 & \text{otherwise} \end{cases} \]

Which are used to capture the individual effects (either fixed or random). The \( y_{it} \) is the dependent variable, i.e. non-performing loan (NPL) and \( X_{it} \) represents the interest rates (INTR), inflation rates (INF) and gross domestic product (GDP), where \( i \) (number of countries) =1,2,….,12 and \( t \) (time period) = 1,2,….,9.

Descriptive Statistics: Table 1 presents the descriptive statistic of returns for (NPL), (INTR), (INF) and (GDP) while Table 2 represents the correlation coefficient between variables. The descriptive statistics include: mean, maximum, minimum, coefficients of variance and standard deviation. Table 2 shows strong correlations between non performance and interest rates and inflation rate and interest rates.

RESULTS

The result for Breusch and Pagan Lagrange multiplier test is shown in Table 3. The null hypothesis of pooled data method is rejected (chi-square less than 0.05). Thus, the study uses random-effect GLS method in determining the macroeconomics implication on non-performance loan.
the long run will capture the effect of a less volatile price regime and therefore will be less risky. Therefore, in the long-run, we estimate a positive coefficient, indicating lower inflation volatility that can contribute to the better performance of the ratio of bad loan. As for GDP, the relationship is suggested to be inverted. We argue that as time goes, the NPLs will deteriorate when GDP increase. During the period, more economic activities are taken place and thus, more revenue is obtained by businesses institutions and individuals which lead to rising on the debt payment, thus reducing bad loan significantly. Our result supports those of Nkus [5] Espinoza and Prasad [9] and Rajan and Dhal [10].

CONCLUSIONS

The study examines the implications of macroeconomic indicators on NPL in twelve Asia Pacific and South Asia countries during the year 2000 through 2008. Yearly sample dataset of Hong Kong, Indonesia, Korea, Malaysia, Thailand, Singapore, Philippines, Singapore, Australia, China, Japan, India and Bangladesh are used. Applying Generalized Least Square (GLS) of panel data technique, the overall result shows the non-performing loan in Asian Pacific South and South Asia Region is significantly influenced by the interest rate, inflation rate and gross domestic product, parallel findings with those of previous studies. However, our result challenges the earlier findings on the short term positive effect of inflation rate on NPL. We postulate that the effect will be positive only for the long run since the NPL will capture the effect on a less volatile price regime. The cost implication of bad loan to the nation is great particularly for taxpayers and depositors. Moreover, it reduces bank assets and erosion of their capital causing further liquidity problems.

REFERENCE