Analysis of Nonperforming Debts' Impact on Profitability and Liquidity of Some Iraqi Commercial Banks for the Period between 2011-2018

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Abstract

In the banking world, the non-performing debts are considering one of the main critical that have almost all commercial banks attention. Hence, this study aimed to know the impact of non-performing loans on profitability and liquidity of commercial banks, where it has found a fundamental impact on its various profitability activities such as return on equity assets. The study was conducted on a group of the Iraqi commercial banks, 10 banks, for the period (2011-2018), and panel data models were used to analyze and demonstrate the impact of non-performing bank loans on profitability, return on equity (shareholders 'equity), and return on assets. In return, the study did not find such an impact of liquidity size because it determines by monetary authority represented by Central Bank of Iraq (CBI) and it related significantly to loans, the higher the proportion of loans the greater the proportion of its reserves.

Keywords

Non-performing Debts, Profitability, Liquidity, Commercial Banks.

Introduction

The banking sector has an impact on most of the economic and financial sectors, and therefore its success and progress depend on several criteria, including the growth of banks’ profitability and its relationship to the economic and financial developments experienced
by each country. Although bank credit is usually governed by policies and standards aimed at reducing expected credit risks to ensure the stability of economic activity, but the borrowing process are always accompanied by risks such as failure of repaying back some loans on right scheduled periods. This is because of the possibility of events or influences that are related to either borrower or the lender, and other reasons related to changes in the surrounding external environment, or that are caused by these factors combined that could lead to the failure of bank loans.

Nonperforming debts are one of the biggest issues facing economies and governments, exposing banks to real problems in the field of credit that would undermine confidence in the banking sector, where high nonperforming loan ratios directly affect the performance of banks, and limit their ability to borrow and exercise their role in development process and thus low rate of return which negatively affects the economy as a whole.

**Research Problem**

Nonperforming debts generally have negative effects on banks, as they may hinder their business and ability to keep pace with developments in the global banking industry, where banks are obliged annually to increase the proportion of provisions for doubtful debts to meet this matter, as well as losses resulting from failure to pay back these debts and that affects the bank’s reserves, capital, and liquidity.

**Research Objectives**

Identifying the most important factors that affect the Iraqi banking system, including increasing non-performing debts (their causes and classifications) and the effects of increasing these debts and delaying their payment of which they due.

**The Importance of Research**

The research derives its importance through studying the most important risks facing the banking sector, which would negatively affect the performance of these banks, and the most important of these risks is the bank debts and knowledge of its impact on the profitability of commercial banks. As well as the size of bank liquidity and finding ways to reduce bad debts.

**Research Hypotheses**

1- There is a statistically significant effect of non-performing loans on the profitability of commercial banks at $\alpha \leq 0.05$. 
2- There is a statistically significant effect of non-performing loans on the liquidity of commercial banks at $\alpha \leq 0.05$.

**Research Methodology**

The research methodology included collecting necessary data from two main sources as follows:

1. Primary sources: represented by using an analyzing method of financial data and adopting the inductive and deductive approach to extract the results from the primary sources represented in the financial reports of Iraqi commercial banks, the research sample was analyzed according to the panel data models.
2. Secondary sources represented in books, references, studies and scientific researches that enhance our research.
3. The study was conducted on a sample of 10 Iraqi commercial banks, for the period 2011-2018, by using the financial statements published in the Iraq Stock Exchange (ISE).

**The Theoretical Background**

**The concept of non-performing bank loans:** It can be defined as the debts that borrowers are unable to meet their obligations to pay on their expected maturity dates, because the borrowers are unable to repay due to an event, certain circumstances, or imbalances that surrounded their business activity (Sahlawi. 2018).

Another definition: It is all kinds of credit facilities granted by banks or other financial institutions to some customers in which have to be repaid the premiums and interest due in specific times. But over time, these credit facilities have turned into stagnant or bad debts. The reason is because of borrower's inability to meet their obligations which, as result, can be said that there is highly possibility of an obvious loss to the bank (Al-Obaid & Youssef. 2015).

**Types of Bad Debts**

The bank and the supervisory authorities rely on general rules and methods for classifying its assets, as it divides the loans into the following categories (Bessissa. 2015).
1. Collectible loans: These are in which the loan, its interest, and its commissions are paid according to the agreed terms without having negative issues that may surround borrowers and their credit capacity to repay.

2. Irregular loans subject to losses’ possibility (non-performing loans): The loans that have not been paid in accordance with the terms of concluded contract because the debtor may faces either financial or economic difficulties that may affect on principal of loan, its interest, its commission, or both. Usually this category of loans are due for one or more premium, or have been due for more than 90 days (Bessissa. 2015) & (Al-Hajj. 2005).

The Iraqi banking sector nevertheless suffers from the aggravation problem of non-performing loans, and the negative effects of this problem on financial stability in one hand and the banking sector in other hand. Table No. (1) however shows non-performing loans in the Iraqi banking sector for the period (2011-2018).

Table 1 Non-performing debts size in Iraqi commercial banks, amounts in billion Iraqi dinars (IBD)

<table>
<thead>
<tr>
<th>Bank's name</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
<th>2015</th>
<th>2016</th>
<th>2017</th>
<th>2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baghdad</td>
<td>18</td>
<td>21</td>
<td>14</td>
<td>17</td>
<td>20</td>
<td>40</td>
<td>48</td>
<td>58</td>
</tr>
<tr>
<td>Commercial Iraq</td>
<td>94</td>
<td>81</td>
<td>69</td>
<td>58</td>
<td>48</td>
<td>53</td>
<td>48</td>
<td>44</td>
</tr>
<tr>
<td>United Bank</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>5</td>
<td>10</td>
<td>17</td>
<td>21</td>
<td>30</td>
</tr>
<tr>
<td>Al Ahly Iraqi</td>
<td>15</td>
<td>12</td>
<td>8</td>
<td>8</td>
<td>10</td>
<td>19</td>
<td>18</td>
<td>6</td>
</tr>
<tr>
<td>Iraqi Credit</td>
<td>32</td>
<td>35</td>
<td>59</td>
<td>78</td>
<td>99</td>
<td>100</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>Economy</td>
<td>17</td>
<td>18</td>
<td>21</td>
<td>25</td>
<td>45</td>
<td>93</td>
<td>87</td>
<td>93</td>
</tr>
<tr>
<td>Commercial gulf</td>
<td>9</td>
<td>4</td>
<td>7</td>
<td>11</td>
<td>13</td>
<td>12</td>
<td>19</td>
<td>25</td>
</tr>
<tr>
<td>Alshamal</td>
<td>0</td>
<td>2</td>
<td>11</td>
<td>14</td>
<td>19</td>
<td>22</td>
<td>26</td>
<td>25</td>
</tr>
<tr>
<td>Ashour</td>
<td>6</td>
<td>3</td>
<td>1</td>
<td>15</td>
<td>82</td>
<td>95</td>
<td>97</td>
<td>93</td>
</tr>
<tr>
<td>Commercial Region</td>
<td>0</td>
<td>0</td>
<td>24</td>
<td>14</td>
<td>15</td>
<td>14</td>
<td>16</td>
<td>20</td>
</tr>
</tbody>
</table>

Profitability and Liquidity

First: Profitability: It is a bank’s desire to increase the value of its owners ’wealth by achieving profits resulting from investing their money in specific projects and distributing them after retaining a portion of profits as reserves. In other words, these projects should achieve profits with the same percentage or more in comparison with other projects in other banks that are exposed to same degree of risk (Ziad & Mahfouz, 2006).

Measures of Profitability Indicators

The commercial bank aims mainly to achieve the largest possible profitability, so a set of financial ratios has been established aimed at measuring the efficiency and effectiveness of the bank in generating profits, because the bank that does not generate enough profits,
ensuring its presence into competition market will be risky. Therefore, profitability ratios are the most indicative tools reflecting a commercial bank performance during that indented period (Ziad & Mahfouz, 2006). Among the most important ratios of profitability are the following:

1- **The rate of return on equity (ROE):** It means amounts of return that owners receive as a result of investing their money at the organization, and it is considered as the most comprehensive criterion for measuring management effectiveness (1) it measures the profitability of assets and (2) it measures also the profitability of the capital structure. Hence, it is a tool to know a profitability each of investment and financing decisions. It can be calculated through the following formula:

\[
\text{Return on equity (ROE)} = \frac{\text{Net Profit}}{\text{Shareholders Equity}} \times 100
\]

2- **The Return on Assets (ROA):** It is one of profitability measurements that reflects the relationship between profits & the available amounts to management. In other words, it express the management ability to achieve funded profits of operational and investment activities and does not reflect the financing activities. ROA can be calculated by the following equation:

\[
\text{Return on Assets (ROA)} = \frac{\text{Net Income}}{\text{Total Assets}} \times 100
\]

**Second: Liquidity:** It means a bank’s ability to pay in cash to all its commercial obligations and a quick respond to credit requests or grant new loans or covering the increasing of deposit withdraw by keeping a portion of its assets in liquid cash form (Ahmed. 2013). The following however are the most common liquidity indicators.

1. **Monetary credit Ratio:** This percentage indicates saved cash in fund and cash in central bank in addition to other balances such as foreign currencies and gold coins in order to fulfill (meet) its banking obligations after subtracting liabilities. According to the following formula (Ahmed.2013) & (Abdul Sadah & etc. 2018).

\[
\text{Monetary credit Ratio} = \frac{\text{Cash in the fund} + \text{cash in central bank} + \text{other liquid balances}}{\text{Deposits}} \times 100
\]

2. **Legal Reserves Ratio:** usually banks maintain a certain percentage of the available amounts from various deposits in the central bank in the form of a credit balance held by the aforementioned bank without interest, this balance is called the legal reserve, and it is measured according to the following formula (Sonya.2015).

\[
\text{Legal Reserves Ratio} = \frac{\text{Cash balance in central bank}}{\text{Deposits}} \times 100
\]

3. **Legal Liquidity Ratio:** it represents the extent of the primary and secondary reserves' ability to meet the financial obligations owed by the bank in various circumstances.
Therefore, the greater the legal liquidity rate, the increase bank’s liquidity and usually it ranges between (30-35%) as a maximum in most economic systems (Sonya. 2015).

\[
\text{Legal Liquidity Ratio} = \frac{\text{Primary reserves} + \text{Secondary reserves}}{\text{Deposits}} \times 100
\]

4. As well as, investment ratio refers how the bank is efficient to employee the amounts coming from deposits to meet credit requests. Hence, the higher the percentage means that the bank is more able to meet borrowing and vice versa.

Theoretical Framework for Panel Models and Data Analysis

Panel data models are considered as one of the important models in the field of economic sciences due to they have particular importance in increasing the number of observations, which allows to reach more reliable results, as well as the absence or recession of many econometric problems such as the problem of unsteadiness of an error randomization variance (Diebold. 2017).

Panel data concept and its importance: It means cross-sectional observations (countries or companies) that monitored over a specific time period, i.e. these data have two dimensions, the first is for time series, and the second is for cross-sections (Diebold. 2017). It however should be noted that panel data has a synonym term which called longitudinal data (Frees. 2014).

Panel data models have gained an increasing attention especially in economic studies since they are taking into account an effect of the difference between cross sections and time change. (Baltagi. 2005) has mentioned a set of points that demonstrate the model importance as below:

1. Control of individual heterogeneity, which may appear in time series or cross-sectional date in which may result to have biased results. Plus, panel data gives more additional information with less synchronous linear relationship between the variables. Hence the panel data is characterized by a greater number of unbiased results & better efficiency.

2. Panel data are more able to study the dynamics adaptation that cross-sectional data may hides. It is also suitable to study unemployment and competition rates in market economy. In addition, it can shed light on the speed of adjustments to economic policy changes if these data were long enough.

3. Panel data is more able to identify & measure effects that cannot be simply detected by cross sections or time series data.
4. Panel data models allow building and testing behavior models that are more complex than cross-sectional data or time series. For example, technical competence is better studied other than utilizing cross-section & time series.

5. Panel data for individual units such as companies may be more accurate than similar data at the macroeconomic level.

**Main Samples to Analyze Panel Data**

The following is the general formula of panel data (Hsiao. 2003).

\[ y_{it} = \beta_{0(i)} + \sum_{j=1}^{k} \beta_j X_{j(it)} + \varepsilon_{it} \]

Where

- \( y_{it} \): Dependent variable.
- \( \beta_{0(i)} \): The intersection point of view \((i)\).
- \( \beta_j \): Value of the slope of the regression line.
- \( X_{j(it)} \): The value of the explanatory variable \((j)\) in view \((i)\) at the time period \(t\).
- \( \varepsilon_{it} \): Random error.

**Samples of Panel Data as Follows**

**Pooled Regression Model (PM):** This model is one of the simplest panel data models in which all coefficients \(\beta_{0(i)}\) & \(\beta_j\) are constant over time length, this means that this model neglects the time effect. Therefore, by rewriting equation above, the PM form is going to be as follows (Gujarati & Porter. 2009).

\[ y_{it} = \beta_{0(i)} + \sum_{j=1}^{k} \beta_j X_{j(it)} + \varepsilon_{it}, \]

Hence: \( E(\varepsilon_{it}) = 0 \)

\( var(\varepsilon_{it}) = \sigma^2 \)

This mean that the Ordinary Least Squares (OLS) is used to evaluate model data above (Gujarati & Porter. 2009).

**Fixed Effects Model (FEM).** The goal of the fixed effects model is to know the behavior of each sectional data set separately, by making the parameter \(\beta_0\) varies from one set to another with the slope coefficients \(\beta_j\) remaining constant for each sectional data set. Thus, the FEM model is going to be as follows (Cameron & Trivedi. 2005).
In order to estimate the model's functions in previous equation and allowing the parameter function ($\beta_0$) to be varied between the sectional sums, imaginary variables are used of (n-1) in order to avoid complete linear polymorphism, and then the usual least squares OLS method is used. It is worth noting that Fixed Effect Model is called 'Least Squar

\begin{equation}
\begin{align*}
y_{it} &= \beta_{0(i)} + \sum_{j=1}^{k} \beta_j X_{j(it)} + \varepsilon_{it}, \\
\text{Therefore} (\varepsilon_{it}) &= 0 \\
\text{var} (\varepsilon_{it}) &= \sigma^2
\end{align*}
\end{equation}

Thus, after adding the phantom variable to equation above, it will becoming as follows:

\begin{equation}
\begin{align*}
y_{it} &= \alpha_1 + \sum_{d=2}^{N} \alpha_d D_d + \sum_{j=1}^{k} \beta_j X_{j(it)} + \varepsilon_{it},
\end{align*}
\end{equation}

where, $\alpha_1 + \sum_{d=2}^{N} \alpha_d D_d$: The changing of group sectional of $\beta_0$ function.

**Random Effects Model (REM):** Unlike Fixed Effects Model, the REM deals with timing & sectional effects that are being random parameters and not fixed parameters. This assumption is based on that the sectional and temporal effects are independent random variables on average equals to zero & a specific variation, and are added as random components in random error limits of the model. Thus, REM would assume $\beta_{0(i)}$ as a random independent that has an average value of $\mu$ as explained below (Cameron & Trivedi. 2005).

\begin{equation}
\begin{align*}
\beta_{0(i)} = \mu + \nu_i.
\end{align*}
\end{equation}

By substituting FEM's equation with REM's equation, the new random effects model (REM) is going to become as follows:

\begin{equation}
\begin{align*}
y_{it} &= \mu + \sum_{j=1}^{k} \beta_j X_{j(it)} + \nu_i + \varepsilon_{it},
\end{align*}
\end{equation}

Where, $\nu_i$ is error limit of the sectional data group (i)

Because there are two compounds of to error-$\nu_i$ and $\varepsilon_{it}$, the REM is also called Error Components Model. And when random parameters model is estimated, in this case it is not relied on the method of ordinary least squares because it may gives inefficient capabilities,
plus it has incorrect standard errors which then it will affect the parameters test (Verbeek. 2017).

The Preference between the Mentioned Models

The differentiation between models could be done through the Hausman test, which is based on the difference between fixed effects & random effects. It is as an extent to which the individual effect is related to variables, where this test is used to find out which of the effects is more appropriate to estimate the model whether the fixed effects models or random effects models. Thereby, the Hausman test formula is as follows (Verbeek. 2017):

$$H = (\beta_{FEM} - \beta_{REM})' [\text{var}(\beta_{FEM}) - \text{var}(\beta_{REM})]^{-1} (\beta_{FEM} - \beta_{REM}),$$

Where $(\beta_{FEM} - \beta_{REM})$ is the difference between fixed effects values & random effects values.

$\text{var}(\beta_{FEM}) - \text{var}(\beta_{REM})$ is the difference between combined variance of each of the fixed effects values and the random effects values.

Therefore, if the calculated value of Hausman test is greater than tabular value, or if Chi-Sq. Statistic value is significant, then the hypothesis (H0) in which supports the random effects model is rejected, and the alternative hypothesis (H1), which states that fixed effects model is the best model, is accepted. meanwhile, if the calculated value is less than the tabular value, or Chi-Sq. Statistic is not significant, then a hypothesis (H0) in which supports the random effects model would be accepted, and the alternative hypothesis (H1) is rejected, the random effects model is the best model in other words.

Practical Search Results

The effect of non-performing loans on bank's profitability: In order to determine an appropriate model to demonstrate the impact of non-performing loans on bank's profitability, we used the Haussmann test and its results are shown in the table below.

<table>
<thead>
<tr>
<th>Test Summary</th>
<th>Chi-Sq. Statistic</th>
<th>Chi-Sq. d.f</th>
<th>Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cross-section random</td>
<td>4.798</td>
<td>1</td>
<td>0.028</td>
</tr>
</tbody>
</table>

By observing the previous table, Haussmann test results showed that the Chi-Sq. Statistic value is significant at a level less than (0.05), so we reject hypothesis (H0) and the alternative hypothesis (H1) is being accepted. Thus, the fixed effects model (FEM) is the appropriate model for estimating the impact of non-performing loans on profitability as shown in the table below;
Table 2 The Impact of non-performing loans on bank's profitability:

<table>
<thead>
<tr>
<th>Variable</th>
<th>Fixed Effects Model</th>
<th>Random Effects Model</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Coefficient</td>
<td>Std. Error</td>
</tr>
<tr>
<td>Constant</td>
<td>8.298</td>
<td>1.219</td>
</tr>
<tr>
<td>X</td>
<td>-0.101</td>
<td>0.031</td>
</tr>
<tr>
<td>R-square</td>
<td>0.199</td>
<td></td>
</tr>
<tr>
<td>Adjusted R-squared</td>
<td>0.082</td>
<td></td>
</tr>
<tr>
<td>F-statistic</td>
<td>1.714</td>
<td></td>
</tr>
<tr>
<td>Prob (F-statistic)</td>
<td>0.094</td>
<td></td>
</tr>
</tbody>
</table>

Source: The authors

The following table shows two essential points:

A- There is a significant adverse effect between non-performing loans and bank profitability which means that the higher the percentage of non-performing loans in the bank, the lower the profitability of these banks because non-performing loans reduce the bank’s profits.

B- The value of the F test was (1.714) with a probability of (0.094). This indicates the acceptability of the model as a whole, and the estimated used model is good.

The effect of bad loans on bank liquidity: In order to determine the appropriate model for showing the effect of bad loans on liquidity, we also relied on Haussmann test and its results are shown in the table below:

<table>
<thead>
<tr>
<th>Test Summary</th>
<th>Chi-Sq. Statistic</th>
<th>Chi-Sq. d.f</th>
<th>Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cross-section random</td>
<td>1.611</td>
<td>1</td>
<td>0.2043</td>
</tr>
</tbody>
</table>

By observing the previous table, the Haussmann test results showed that Chi-Sq Statistic value is insignificant at a level that's less than (0.05); therefore we accept the hypothesis (H₀) and reject the alternative hypothesis (H₁). thereby, the random effects model is the
appropriate model for estimating the impact of non-performing loans on liquidity, as shown in the table below.

<table>
<thead>
<tr>
<th>Table 3 The Impact of non-performing loans on liquidity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dependent Variable: Y2</td>
</tr>
<tr>
<td>Sample: 2011 – 2018</td>
</tr>
<tr>
<td>Cross-sections included: 10</td>
</tr>
<tr>
<td>Total panel (balanced) observations: 80</td>
</tr>
</tbody>
</table>

| Variable   | Fixed Effects Model | Random Effects Model |          |          |          |          |          |
|------------|---------------------|----------------------|----------|----------|----------|----------|
|            | Coefficient | Std. Error | t-Statistic | Prob | Coefficient | Std. Error | t-Statistic | Prob |
| Constant   | 79.733     | 6.888     | 11.574     | 0    | 77.907     | 16.651     | 4.678      | 0.00 |
| X          | 0.298      | 0.175     | 1.700      | 0.093| 0.354      | 0.1701     | 2.081      | 0.040|

Source: The authors

The Previous Table Shows Two Fundamental Points

A- There is a direct moral effect between non-performing loans and bank's liquidity which means that the higher the percentage of non-performing loans in the bank, the higher the level of its liquidity, due to the rise of non-performing loans leads to bank hedging and retaining a greater part of its money.

B- The value of F test was (4.299) with a probability of (0.041). This indicates the significance of the model as a whole, and the utilized model is good.

Results and Recommendations

Based on the hypotheses testing, the following conclusions were reached:

- The study found that there was a statistically significant effect at \( \alpha \leq 0.05 \) of non-performing bank loans of commercial banks profitability in all their activities, including return on equity & return on assets.
- The study concluded that there is no statistically significant effect at the level \( \alpha \leq 0.05 \) of non-performing bank loans on liquidity for commercial banks, and there is a direct relationship between loans and liquidity, which means the higher the percentage of loans, the more banks hedge to maintain greater liquidity.
Recommendations

According to previous results, the study recommends the following:

- Banks need to pay more attention to financial credit analysis. Banks also should apply a model to predict non-performing loans in order to reduce credit risks and the need to pay attention to the motivating factors for credit analysts on financial analysis by increasing a degree of delegation in making the right decision to grant credit & avoid potential risk.
- Reducing a credit size for banks who have a large balance of non-performing loans, and credit limit should not increase except for banks who active in collecting debts.
- Continuous follow-up of the customer’s business activity after granting the loan for making an appropriate decision in case of the emergence of a troubled bank credit.
- The necessity to adopting selling mortgaged money law and simplifying procedures so that the bank can recover its outstanding right. As well as banks must take care of the labor, train it, and qualify it in all investment and legal activities to reduce default.
- The necessity of an internal control that audits all financial banking activities including risk management. in addition, put in place effective and firm operational controls especially in the field of information systems.

References


