CAMELS FINANCIAL RATIOS ANALYSIS AS THE PREDICTORS OF BANK PROBLEMS THAT LISTED IN THE DIRECTORY OF INDONESIAN BANKING FROM 2002-2006

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ABSTRACT

This study aimed to provide empirical evidence on factors affecting bankruptcy and financial troubles of a banking institution. The factors tested in determining the bankruptcy condition and company’s troubles were CAMELS ratios related to the regulations of the Bank of Indonesia. CAMELS ratios are stand for Capital adequacy, Assets quality, Management quality, Earnings, Liquidity, and Sensitivity to market risk. The samples of the study consisted of 10 healthy banks, one bank experiencing bankruptcy, and 4 banks experiencing financial trouble condition. The statistical method used to test the hypothesis of the study was a logistic regression. The result of the study indicates that the CAMELS ratios had a clarification power or a predictable power toward the banks experiencing financial troubles and the banks experiencing bankruptcies. This study also proved that the ratios of CAR (capital adequacy ratio), P-PPAP, ROA (return on assets), ROE (return on equity), NIM (net interest margin), and LDR (loan to deposit ratio) were statistically different from the condition of the bankrupt banks and the banks experiencing financial troubles compared to the bank that did not experience financial troubles.

Key Words: Financial Trouble, Bankruptcy, Ratio of CAMELS, Logistic Regression
INTRODUCTION

Banks are the leaders of the financial-service industry. The banking industry, composed of hundreds of private and state-owned companies worldwide, affects the welfare of every other industry and the economy as a whole. Healthy banks and healthy economies just seem to go together. If the bank unhealthy so does the nation. On other words, the role of banks for individual, societies, and for economics growth and development is very important. As a financial intermediation, banks are involved in transferring funds from savers to borrowers and in paying for goods and services. The financial services they offer are ranging from checking accounts and savings plans to loans for businesses, consumers, and governments. Banks services are expanding today to include security trading and underwriting, insurance protection, financial planning, the management of pension plans, advice for merging companies, and other innovative services (Rose et.al., 2005). There is no doubt, the role of banks is very important so does in implementing a nation’s monetary policy.

The effectiveness of monetary policy is influenced by bank’s health and stability. By seeing its strategic role, bank’s health and stability is very important for measuring its performance and sustainability. The healthy bank as a system is needed by economy of a nation for economics growth and development. Bank’s health and stability influences the rise and fall of economy of a nation.

Financial crisis that hit Indonesia in 1997 is an example of how the fall of the banking sector may destroy the economy. Bank failures are widely perceived to be more damaging than the failure of other type of business firms. In May 1997, global speculators attacked the Philippines, Malaysia and Indonesia currencies, all with great success. These attacks were considered the beginning of the East Asian crisis and resulted in a
regional economic crash. The impact on the Indonesian economy was massive. Part of the impact was:

- Many big and small-scale companies went bankrupt especially those in the construction, manufacturing, and banking sectors.
- Capital flight was in the range of US$ 20 billion in 1998.
- Price soared, the inflation rate steadily crept up to double digits and reached 77.6% in 1998.
- Many people lost their jobs, the unemployment rate was 20% of the labour force. The poorest were in economic hardship, as many as 50 million Indonesian faced a return to poverty.
- The currency was in sharp depreciation (devaluated by around 500%).
- The stock market plunged from average of 550 to an average of 350 in the Jakarta Stock Exchange index.

The reasons of the declining of bank’s performances, as conclusion from the restructuring the banking sector seminar in Jakarta in the year 1998, were as follows (Almilia, 2005):

a. The increase of non performing loan.
b. There were so many banks liquidated in November 1st 1997 so that the society’s trust to the bank is declining. This may cause a massive withdrawal.
c. The reduction of bank’s capital.
d. There were so many banks can not pay their obligations caused by the reducing of Indonesian exchanged rate.
e. Unprofessional and or mismanagement.

Bank’s health can be measured using some indicators. One of indicators can be seen from its financial report. From financial report, it can be considered the bank’s health. The usual ways in seeing bank’s health are measuring its financial ratios. Financial ratio analysis may help us to see the change (growth or decline) of bank’s operation including the reasons why they are changing. The result of financial ratio analysis may help managers to interpret the association and trend of key indicators so that we may see the potential success and failure in the future.
Bank of Indonesia regulation No: 6/9/PBI/2004 date April 12th 2004 regarding the valuation system of bank’s health, mentions that bank’s health and its financial and non-financial conditions are the interest of all parties including owners, managements, societies, central bank, and or government. The bank’s condition can be used to evaluate the bank’s performance in implementing the prudential principles and the law enforcement of the bank’s regulation and risk management.

Based on Bank of Indonesia’s regulation No: 9/6/PBI/2007 date March 30th 2007 regarding the valuation of bank’s health, mentions that the valuation of bank’s health is the valuation of capital, assets quality, management, earnings, liquidity and sensitivity to market risk factors. These factors are known as CAMELS. CAMELS’ ratios are ratios of financial numerator(s) with another financial denominator (s), so that we can get the picture of good or bad of financial position of a bank.

The valuation of these factors is done through the quantitative valuation and qualitative valuation after considering the materiality and the significant of those factors including the influence of other factors such as the condition of bank industry and the national economy. The conclusions can be obtained objectively based on analysis supported by documented facts, data, and sufficient information in order to get the true condition of a bank.

Based on Circular Letter of central bank (Bank Indonesia) No: 9/24/DPbs date October 30th 2007 regarding the valuation system of bank’s health, describes that:

1. The valuation of bank’s health is based on syariah principle by calculating CAMELS factors using quantitative and qualitative approach, and the influence of bank’s condition and performance to its financial factors and management factors.
2. The valuation of management factors is separated with the valuation of financial factors, in order to get the whole picture of bank’s financial and management condition.
3. The valuation of financial factors is measured by implementing the load of factor rating. The factor rating for capital is 25%, the assets quality is 50%, rentability (earnings) is 10%, liquidity is 10%, and sensitivity to market risk is 5%.

4. The valuation of capital factor, quality assets factor, rentability factor, liquidity factor, and sensitivity to market risk factor is done through the valuation of financial ratios, and the valuation of qualitative factor is done through the professional judgment.

5. The financial ratios used for calculating factor rating of capital, assets quality, earnings (rentability), liquidity, and sensitivity to market risk are separated by key ratios, supplement ratios, and observed ratios.
   - Key ratios have a high impact or influence to the bank’s health.
   - Supplement ratios have a direct influence to the bank’s health.
   - Observed ratios are supplement ratios used in analysis and judgment.

6. The valuation of management factors is done by the valuation of qualitative factors for every aspect of general management, risk management and compliance management.

7. The valuation of composite rate is done through the aggregation of financial factor rate and management factor rate from conversion table by considering supplement factor and professional judgment of materiality and significant aspect of each valuation factor.

8. The calculation of bank’s health rate based on syariah principle is done after considering inherent risk of bank activities that is captured by financial ratios and consideration of judgmental unsure in the valuation of bank’s health.

   There has been significant prior research on bankruptcy prediction using a wide variety of techniques. Those techniques used and developed have advantages and disadvantages, or strengths and weaknesses (Nurazi, 2003). Thomson (1991) in Wilopo (2001) had tested the benefit of CAMEL ratios in predicting bank failure using logistic regression. The benefits of using logistic regression are more flexible and it is relatively free of restrictions. The research found that CAMEL financial ratios are accurate enough in predicting bank failure and arranging bank’s rating. In Indonesia, Surifah (1999) and Amilia (2005) have also checked the benefits of
CAMELS ratios in predicting bank failure. They found that CAMELS model had a predictive power in predicting and making classification of bank that facing financial difficulties and bankruptcies.

THEORETICAL FRAMEWORKS AND HYPOTHESIS DEVELOPMENT

THE DESCRIPTION OF CAMELS VARIABLES

Empirically, research in business failure and bank failure using CAMELS financial ratios had proven that these ratios are beneficial in predicting bank failure, arranging bank’s rating, and classification of bank facing insolvencies and not facing financial troubles (Thomson, 1991, Wilopo, 2001, Nurazi, 2003, and Amilia, 2005).

Based on the circular letter from central Bank of Indonesia No. 9/24/DPbS date October 30th 2007, the valuation of CAMELS factors are: Capital, Asset Quality, Management Quality, Earnings, Liquidity, and Sensitivity to market risk. The description of these variables is as follows:

a. Capital

The valuation of capital is the valuation of its adequacy to cover all the exposure risk today with related to the exposure risk in the future. Components on measuring capital are as follows:

i. The adequacy of fulfilling minimum capital obligation, known as Capital Adequancy Ratio (CAR). CAR ratio compares capital with productive assets based on its risk (Aktiva Tertimbang Menurut Resiko - ATMR). The calculation of capital and productive assets based on its risk follows the regulation of Bank of Indonesia.

ii. Classified productive assets are compared with bank’s capital/equity (Aktiva produktif yang dikelasifikasikan-modal bank/APYD-MB). The amount of classified productive assets are arranged as follows:
   - 25% of productive assets are classified as in special attention (Dalam Perhatian Khusus -DPK).
   - 50% of productive assets are classified as unperformed (Kurang Lancar -KL).
   - 75% of classified assets are classified as doubtful (Diragukan-D).
- 100% of productive assets are classified as non-performed (Macet-M).

Components of productive assets quality follow the Bank of Indonesia’s regulation regarding the quality of productive assets (Kualitas Aktiva Produktif-KAP). The capital can be classified as core’s capital and supplement’s capital.

b. **Assets Quality (Kualitas Aktiva Produktif)**

   The valuation of assets quality is the valuation of bank’s assets condition and the credit risk management inadequacy. The quantitative approach in valuing assets quality components are as follows:

   a. Classified assets quality is compared with productive assets (Aktiva Produktif/APYD-AP). The components of productive assets quality follow the existing regulation of central bank. The amount of classified productive assets is arranged as above.

   b. Non Performing Asset (Aktiva Produktif Bermasalah) is compared with productive assets (NPA-AP). NPA-AP’s ratio is the valuation of non performing assets with productive assets using the regulation of central bank about productive assets quality that classified as unperformed (KL), doubtful (D), and nonperformed (M).

   c. The adequacy rate of accumulation of productive assets quality to write-off (Kecukupan Pembentukan Penyisihan Penghapusan Aktiva Produktif-PemPPAP) follows the regulation from central bank. The ratio used is by comparing PPAP that has been created with PPAP’s obligation to be created.

   c. **Management Quality (Kualitas Manajemen)**

   Most of valuation of management quality is based on the qualitative aspect bank’s management ability in running the bank’s businesses or performing its activities. The valuation of management factors is done by the valuation of qualitative factors for every aspect of general management, risk management, compliance management, and the existing commitment to central bank and other parties. The compliance commitment is the compliance to legal lending limit (Batas Minimum Pemberian Kredit -
BMPK), net foreign exchange position (Posisi Devisa Neto-PDN), and Know Your Customer (KYC) principle.

In this research, the qualitative approach is not considered. The management performance is analyzed using quantitative approach by calculating the net interest margin.

d. Earnings (Rentabilitas)

The valuation of earnings is the valuation in knowing the bank’s earning ability to support operational activities and capital. The components in valuing the earnings are as follows:

a. Return on Assets (ROA)

ROA is calculated by comparing earnings before income tax (EBIT) with total assets.

b. Return on Equity (ROE)

ROE is calculated by comparing earnings after tax (EAT) with equity capital. Equity capital follows the regulation of central bank regarding the obligation of required minimum capital available (Kewajiban Penyediaan Modal Minimum-KPMM).

c. Net Interest Margin (NIM)

NIM is calculated by comparing net interest earned with average productive assets. Net interest earned is interest earned minus interest expenses, whereas productive assets considering the productive assets that obtain interest earned (interest bearing assets).

d. Operational expenses is comparing with operational earned (BOPO). BOPO ratio is calculated by comparing total operational expenses with total operational earnings.

e. Liquidity (Likuiditas)
The valuation of bank’s liquidity is the valuation of bank’s ability in maintaining its adequate liquidity and adequate liquidity risk management. Quantitative approach in calculating liquidity is based on Loan to Deposit Ratio (LDR) component. LDR ratio is calculating by comparing loan with deposit from the third parties. Loan is credit given to the third parties except credit to other banks. Loan or credit to the third parties including saving account, checking accounts, and deposit except account between banks.

f. Sensitivity to Market Risk (Sensitivitas Terhadap Risiko Pasar)

The valuation of sensitivity to market risk is the valuation of bank’s equity capital ability to cover all possible impacts caused by market risk changing and market risk management. Sensitivity to market risk is not considered in this research since most of the valuation using qualitative approach.

A wide variety of techniques and theoretical frameworks have been reviewed on bankruptcy or failure prediction. As McKee (2000) and Nurazi (2003) summarized that “there has been significant prior research on bankruptcy prediction using a wide variety of techniques.” These include:

- Univariate models (Beaver 1966).
- Multiple discriminant analysis (Altman 1968, McKee 1976).
- Linear probability models (Meyer & Pifer 1970).
- Multivariate conditional probability models such as Logit and Probit (Ohlson 1980).
- Recursive partitioning models (Marais et al. 1984, Frydman et al. 1985, McKee, 1995a, b).
- Survival analysis (Proportional hazard model) (Lane et al. 1986).
• Rough sets approach” (McKee 2000, Slowinski & Zopoundis 1995).

From the above attempts, a consistent and successful model is still not available. Nevertheless, each model developed can be useful in certain conditions and used under certain assumptions. In sum, no one model dominates or masters another model.

This research proposed two hypotheses namely: (1) there is no significant difference between health banks and in trouble banks using CAMELS ratios, and (2) there is no significant influence in predicting bank failure using CAMELS ratios. This research will examine what is the influence variable in predicting failure.

RESEARCH METHODOLOGY

1. Population, Samples and the Sources of Data

The population in this research is all commercial banks that registered in the central bank (BI) directory. Based on completed data, it is found 20 commercial banks as samples. These banks were observed from 2002-2006. It was found 60 observations.

Data used was secondary quantitative data. Data were obtained from Bank of Indonesia Directory that can be downloaded from the internet (http://www.bi.go.id). Sampling technique used was purposive sampling method namely sample was obtained using certain judgment and criteria. The judgment and criteria were as follows:

1. The samples are listed in the directory of central bank from 2002 – 2005.
2. The commercial banks as samples had issued or published their financial report from 2002 - 2005.
3. There were two categories of commercial banks:

   a. Trouble Banks with criteria:
- Bankrupt banks that had been shutdown in January 13th 2005 by Indonesian Government based on government decree No. 25 year 1999 regarding liquidated banks.
- Restructured banks and banks in special attention (Special Surveillance). Banks in special surveillance, based on central bank regulation No. 9/6/PBI/2007 about banks’ status and banks’ surveillance, are banks that having CAR less than 8%, and having net Non Performing Loan more than 5% from total loan,
- Banks that having loss 3 years in a row from 2002-2004 (criteria of delisting).
- Banks that having loss 75% from equity capital from 2002 - 2004 (KUHD-Business regulation book, verse 147:2).

b. Healthy banks with criteria:
- Banks that were not under capital restructuring or not under special surveillance (Bank of Indonesia circular letter No. 9/6/PBU/2007), and still operate until December 31st 2005.
- Those banks were not loosing from 2002 -2004.

Based on the above criteria, there were 20 commercial banks can be considered as sample. The sample is as follows:

Table 1. List of commercial banks observed from 2002-2005 as sample.

<table>
<thead>
<tr>
<th>No.</th>
<th>Name of Commercial Banks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>PT. Bank Agroniaga, Tbk</td>
</tr>
<tr>
<td>2.</td>
<td>PT. Bank Akita</td>
</tr>
<tr>
<td>3.</td>
<td>PT. Bank Anglomas 1)</td>
</tr>
<tr>
<td>4.</td>
<td>PT. Bank Antar Daerah 1)</td>
</tr>
<tr>
<td>5.</td>
<td>PT. Bank Arta Niaga Kencana 1)</td>
</tr>
<tr>
<td>6.</td>
<td>PT. Bank Arta Graha Internasional, Tbk</td>
</tr>
<tr>
<td>7.</td>
<td>PT. Centratama Nasional Bank</td>
</tr>
<tr>
<td>8.</td>
<td>PT. Bank Century, Tbk 1)</td>
</tr>
<tr>
<td>9.</td>
<td>PT. Bank Dipo Internasional</td>
</tr>
<tr>
<td>10.</td>
<td>PT. Bank Eksekutif Internasional 1)</td>
</tr>
<tr>
<td>11.</td>
<td>PT. Bank Fama 1)</td>
</tr>
<tr>
<td>12.</td>
<td>PT. Global Internasional Bank 2)</td>
</tr>
<tr>
<td>13.</td>
<td>PT. ICBC Indonesia</td>
</tr>
<tr>
<td>14.</td>
<td>PT. Bank Nusantara Parahyangan, Tbk</td>
</tr>
<tr>
<td>15.</td>
<td>PT. Bank Sinarmas</td>
</tr>
<tr>
<td>16.</td>
<td>PT. Bank Swadesi, Tbk</td>
</tr>
<tr>
<td>17.</td>
<td>PT. Bank Sinar Harapan Bali 1)</td>
</tr>
<tr>
<td>18.</td>
<td>PT. Bank Sri Partha 1)</td>
</tr>
<tr>
<td>19.</td>
<td>PT. Bank Victoria Internasional, Tbk</td>
</tr>
</tbody>
</table>
Data source: Bank Indonesia, 2008

Notes:

1) In trouble banks because they were concluded as restructured banks, special surveillance banks, loss 3 years in a row, and or loss more than 75% from equity capital from 2002-2004.
2) In trouble banks because of bankruptcy.

2. Variables Definition

Operational CAMELS variables, based on Bank of Indonesia’s regulation No. 9/6/DPbs dated October 30th 2007, were calculated as follows:

1. Capital
   a. Capital Adequacy Ratio (CAR)

   \[
   \text{CAR} = \frac{\text{Bank’s Equity Capital}}{\text{Total Weighted Assets Risk (ATMR)}} \times 100\%
   \]

   b. Classified productive assets over bank’s equity capital (APYD-MB)

   \[
   \text{APYD-MB} = \frac{\text{Classified productive assets}}{\text{Bank’s equity capital}} \times 100\%
   \]

2. Asset Quality
   a. Classified productive assets over productive assets (APYD-AP)
APYD-AP = \frac{Classified productive assets}{Productive assets} \times 100%

b. Non Performing Assets over Productive assets (NPA-AP)

NPA-AP = \frac{Non performing assets}{Productive assets} \times 100%

c. Allowance for bad productive assets (Pemenuhan PPAP/PemPPAP)

PemPPAP = \frac{PPAP’s created}{PPAP’s obligation to be created} \times 100%

3. Management and Earnings (Rentabilitas)

a. Return on Assets (ROA)

ROA = \frac{EBIT}{Total Assets} \times 100%

b. Return on Equity (ROE)

ROE = \frac{EAT}{Average Equity Capital} \times 100%

c. Net Interest Margin (NIM)

NIM = \frac{Net interest earned}{Productive assets} \times 100%

d. Operational expenses over Operational income (BOPO)

BOPO = \frac{Operational expenses}{Total operational income} \times 100%

4. Liquidity

LDR = \frac{Total loan}{Total Deposit} \times 100\%
3. Data Analysis

Data were analyzed using statistical package for social science’s program version 14 (SPSS 14.0) with the following steps:

a. Hypothesis I testing

Before testing the hypothesis 1, the normality of the data was analyzed. The sample data was analyzed using Kolmogorov Smirnov test with 5% significance level. Test of differences was used to know what tool of analysis will be used (parametric or non-parametric). If $P$ value $> 5\%$ the data were distributed normally.

If the data were distributed normally, Thus hypothesis 1 was analyzed using Independent T-test. If $P$ Value $> 0.05$ so Ho is rejected and Ha accepted. This means that normally distributed CAMELS ratios have a significance difference between trouble banks and healthy banks.

If the data were not distributed normally, thus hypothesis 1 was analyzed using Mann Whitney U test. If $P$ Value $< 0.05$ so Ho is rejected and Ha accepted. This means that un-normally distributed CAMELS ratios have a significance difference between trouble banks and healthy banks.

b. Hypothesis II testing

Hypothesis II testing was done in knowing the influence of CAMELS ratios to the prediction of commercial banks condition. Since the dependent variable had 2 alternative variables namely trouble (1) and not-trouble (0), thus the model will be tested using logistic regression with the following formulation:

$$P(Y = i) = P(X) = \frac{1}{1 + e^{-(\alpha + \Sigma \beta_i \chi_i)}}$$

or

$$\text{Log } P(X) = \alpha + \Sigma \beta_i \chi_i$$

Notes:
Y = i : variable observed was dependent variable of i\textsuperscript{th}.

Xi : independent variable of i\textsuperscript{th} (CAMELS components).

From the logistic regression, we can find the most influencing variable to predict bank’s failure.

**RESULTS AND DISCUSSIONS**

The normality data, based on CAMEL ratios calculation, is as follows:

Table. 2. The result of the normality data

<table>
<thead>
<tr>
<th>Variabel</th>
<th>Sig.</th>
<th>Keterangan</th>
</tr>
</thead>
<tbody>
<tr>
<td>CAR (Healthy Banks)</td>
<td>0,005</td>
<td>Not Normal</td>
</tr>
<tr>
<td>CAR (Unhealthy/In-trouble Banks)</td>
<td>0,001</td>
<td>Not Normal</td>
</tr>
<tr>
<td>APYD-MB (Healthy Banks)</td>
<td>0,000</td>
<td>Not Normal</td>
</tr>
<tr>
<td>APYD-MB (Unhealthy Banks)</td>
<td>0,038</td>
<td>Not Normal</td>
</tr>
<tr>
<td>APYD-AP (Healthy Banks)</td>
<td>0,000</td>
<td>Not Normal</td>
</tr>
<tr>
<td>APYD-AP (Unhealthy Banks)</td>
<td>0,000</td>
<td>Not Normal</td>
</tr>
<tr>
<td>NPA-AP (Healthy Banks)</td>
<td>0,000</td>
<td>Not Normal</td>
</tr>
<tr>
<td>NPA-AP (Unhealthy Banks)</td>
<td>0,019</td>
<td>Not Normal</td>
</tr>
<tr>
<td>PemPPAP (Healthy Banks)</td>
<td>0,001</td>
<td>Not Normal</td>
</tr>
<tr>
<td>PemPPAP (Unhealthy Banks)</td>
<td>0,002</td>
<td>Not Normal</td>
</tr>
<tr>
<td>ROA (Healthy Banks)</td>
<td>0,004</td>
<td>Not Normal</td>
</tr>
<tr>
<td>ROA (Unhealthy Banks)</td>
<td>0,000</td>
<td>Not Normal</td>
</tr>
<tr>
<td>ROE (Healthy Banks)</td>
<td>0,246</td>
<td>Normal</td>
</tr>
<tr>
<td>ROE (Unhealthy Banks)</td>
<td>0,000</td>
<td>Not Normal</td>
</tr>
<tr>
<td>NIM (Healthy Banks)</td>
<td>0,056</td>
<td>Normal</td>
</tr>
<tr>
<td>NIM (Unhealthy Banks)</td>
<td>0,157</td>
<td>Normal</td>
</tr>
<tr>
<td>BOPO (Healthy Banks)</td>
<td>0,000</td>
<td>Not Normal</td>
</tr>
</tbody>
</table>
As mentioned previously, the normality result was used to determine the following tool of analysis (parametric or non-parametric) for test of differences. As shown from Table 2, CAR, APYD-MB, APYD-AP, NPA-AP, PemPPAP, ROA, ROE, BOPO and LDR were not distributed normally, and one of the criteria had P value < 0.05. For NIM ratio was normally distributed and had P value > 0.05.

**The Result of Hypothesis I test**

Using SPSS 14.0 program, and based on the normality data test, it is found that:

<table>
<thead>
<tr>
<th>Rasio</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>CAR</td>
<td>0.143</td>
</tr>
<tr>
<td>APYD-MB</td>
<td>1.000</td>
</tr>
<tr>
<td>APYD-AP</td>
<td>0.000</td>
</tr>
<tr>
<td>NPA-AP</td>
<td>0.005</td>
</tr>
<tr>
<td>PemPPAP</td>
<td>0.318</td>
</tr>
<tr>
<td>ROA</td>
<td>0.016</td>
</tr>
<tr>
<td>ROE</td>
<td>0.000</td>
</tr>
<tr>
<td>BOPO</td>
<td>0.287</td>
</tr>
<tr>
<td>LDR</td>
<td>0.083</td>
</tr>
</tbody>
</table>

Source: data diolah, 2008

<table>
<thead>
<tr>
<th>Rasio</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>NIM</td>
<td>0.000</td>
</tr>
</tbody>
</table>

Source: data diolah, 2008
Table 3 and Table 4 show that independent variables CAR, APYD-MB, PemPPAP, BOPO and LDR have $P\ value > 0.05$. It can be concluded that Ho is rejected and Ha is accepted. This means CAR, APYD-MB, PemPPAP, BOPO and LDR have no significant difference between healthy banks and unhealthy banks. While, APYD-AP, NPA-AP, ROA, ROE and NIM have $P\ Value < 0.05$. It can be concluded that Ho was accepted and Ha was rejected. This means APYD-AP, NPA-AP, ROA, ROE and NIM have significant difference between healthy banks and unhealthy banks.

**The Result of Hypothesis II test**

The hypothesis II examines what variables have significant influence in predicting Indonesian commercial banks failure using CAMEL (APYD-AP, NPA-AP, ROA, ROE and NIM) ratios in period of 2002–2006. Since the dependent variables have two alternatives, the regression logistic was used using the following persamaan:

$$P(X) = \frac{1}{1 + e^{-(-30.638 + (-2.111) + (-3.915) + 5.165 + 131.276)}}$$

Table 5 shows that APYD-AP, NPA-AP and ROE have no significant influence in predicting banks failure since its $P > 0.05$, namely
APYD-AP is 0,086, NPA-AP is 0,788, and ROE is 0,936. The variables that have significant influence in predicting banks failure are ROA and NIM with P < 0,05, namely ROA is 0,018 and NIM is 0,006.

Table. 6: The goodness of fit table

<table>
<thead>
<tr>
<th>-2 LL Block Number</th>
<th>-2 LL Block Number 0</th>
<th>71,816</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>-2LL Block Number 1</td>
<td>69,565</td>
</tr>
<tr>
<td>Cox &amp; Snell R Square</td>
<td>Cox &amp; Snell R Square</td>
<td>0,225</td>
</tr>
<tr>
<td></td>
<td>Nagelkerke R Square</td>
<td>0,300</td>
</tr>
<tr>
<td>Hosmer and Lemeshow Test</td>
<td>Chi-Square</td>
<td>23,353</td>
</tr>
<tr>
<td></td>
<td>Sig.</td>
<td>0,003</td>
</tr>
</tbody>
</table>

Source: data diolah, 2008

To know whether the data have a better fit to the model, it is found that the value of Likelihood for -2 Log L Block Number = 0 is 71,816 then it is decreasing for -2 Log L Block Number = 1 becoming 69,565. Thus it can be concluded that the regression model has a better fit. By looking at the value of Cox & Snell R Square is 0,225 and Nagelkerke R Square is 0,300, the model can also explain that the model has a better fit (Pallant, 2001 and Cohen, 2001 mentioned that the regression model is not so good if the value less than 0,2). The Hosmer and Lemeshow Test value of 23,353 with significant level of 0,003 also described that the logistic regression is good enough to predict banks failure.

Tabel. 7: Classification table of predictive ability

<table>
<thead>
<tr>
<th>Predicted</th>
<th>Y</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Observed</td>
<td></td>
<td>Correct</td>
</tr>
<tr>
<td></td>
<td>0,00</td>
<td>1,00</td>
</tr>
<tr>
<td>Y = 0</td>
<td>27</td>
<td>3</td>
</tr>
<tr>
<td>Y = 1</td>
<td>18</td>
<td>12</td>
</tr>
<tr>
<td>Overall Percentage</td>
<td>18</td>
<td>12</td>
</tr>
</tbody>
</table>

Source: developed for this research, 2008
Table 7 shows that the percentage correct to predict not failed banks (healthy banks=0) is 90%, and the percentage correct to predict failed banks (unhealthy banks=1) is 40%. The overall percentage of predictive ability is 65%. Type I error ($\alpha$) is a failed (F) bank predicted to be not failed (NF), whereas type II error ($\beta$) is a not failed (NF) bank predicted to be failed (F).

**CONCLUSION**

This research proves that the CAMEL ratios of CAR, APYD-MB, PemPPAP, BOPO and LDR have no significant difference between healthy banks and unhealthy banks. While the CAMEL ratios of APYD-AP, NPA-AP, ROA, ROE and NIM have significant difference between healthy banks and unhealthy banks.

This research also proves that the CAMEL ratios, represented by ROA and NIM, have a significant influence in predicting banks failure. Other independent variables have no significant influence in predicting banks failure. – 2 LL Block number, Cox and Snell R square, and Homer and Lemeshow test show that logistic regression is good enough in predicting banks failure. The percentage correct to predict not failed banks (healthy banks=0) is 90%, and the percentage correct to predict failed banks (unhealthy banks=1) is 40%. The overall percentage of predictive ability is 65%.

Some implications are that this research:

- Could be used as an early warning of bank failure.
- May provide the Indonesian Banking Supervisory Agency with a tool that may help predict future possible problems in the Indonesian banking system.
- Could be used to supervise and monitor the quality of a bank’s assets. Supervision and monitoring are mainly aimed to prevent bank failure.
- Could be used to maintain a safe and sound banking system.
From the above implications, the government and or bank regulators should combine on-site examination and off-site monitoring. In on-site examination, the government and or bank regulators can focus their examination on the management of asset risk and quality, compliance with financial laws and regulations, abnormal and excessive loan growth, and major operational deficiencies.

In off-site monitoring, the government and or bank regulators should develop a monitoring program such as developing an early warning system. This system is supposed to help to identify specific problem areas based on the CAMEL(S) rating system. Using statistical methods in selecting, finding, solving and weighting financial evaluation ratios, specific potential problems can be identified.

Apart from the system the government and or bank regulators can have, the government and or bank regulators should conduct on-site examinations in advance of the routine schedule. The government and/or bank regulators should also conduct specific examinations, and if necessary, establish a file of follow-up tasks, take appropriate steps to remedy the situation, and assess a penalty, if needed. These research findings do not sufficiently explain the whole picture of problems of bank failure complexities.

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INTERNATIONAL CONFERENCE

CERTIFICATE

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Presenter

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