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# Financial Distress Prediction Using Bankometer Model on Islamic and Conventional Banks: Evidence from Indonesia

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## ABSTRACT

This research aims to assess financial distress prediction of Islamic and conventional banks by analyzing Bankometer score between Islamic and conventional banks. This research compared the bankometer scores of four Islamic banks and 10 conventional banks observed for the year period of 2011-2014. The data were obtained from annual reports of the sampled banks from 2011to 2014. The results of this research show that both Islamic and conventional banks had a fine level of resilience against financial distress. This finding suggests that there was no difference of financial distress prediction between Islamic banks and conventional banks. This result also confirms finding Gamaginta & Rokhim (undated), Hanif *et al.,* (2012) and Abdul Rahman & Masngut (2014). On the other hand, contradicts to that of Pappas *et al.,* (2012) who concluded that Islamic banks are 55% less hazardous to failure than conventional banks.

**Keywords**: Financial Distress, Bankometer, Islamic Bank, Conventional Bank

**JEL Classification**: G21, G33

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# INTRODUCTION

## Research Background

Imam and Kpodar (2010) identifies several factors that may positively or negatively influence the growth of an Islamic banking industry, such as Muslim population, GDP, petroleum export, distance to Islamic Financial Centers (I.e. Bahrain and Malaysia), banking system advancement, interest rate, inflation and trade with Middle Eastern countries. Like in many other Muslim majority populated countries, Islamic banking industry in Indonesia has also been growth, stimulated by several factors, such as large Muslim population, government support and Muslim scholar existence etc. (Ismal, 2013:15). The growth of Islamic banking was stated to be larger than that of its conventional counterpart for the year 2001-2004; however, it experienced a slow-down in growth for the year 2005-2010 (Ismal, 2013:20).

Despite its outstanding growth, Ismal (2013:148) stated several facts that indicate the growth of Islamic banking has not yet been optimal, such as the depositors of Islamic banks only consisted of 3,8% of the total Muslim population in Indonesia, lack of fund allocated by the government for the Islamic banking industry and the low number of full-fledged Islamic banks operational within the country. The slow-down of the growth of the Islamic banking industry in Indonesia is something to be aware. Ismal (2013:154) predicted that the Islamic banking industry in Indonesia would have attained a negative growth since 2018, whenthe market share of the industry at that moment should be around 11% in proportion to the whole banking industry in Indonesia. This condition has raised worries as the market share of the Islamic banking industry has currently only been 5%.

A well-established Islamic banking industry would significantly contribute to economy. Economy is an integral part of a healthy and morally upright society, which in fact is the purpose of Islam (Iqbal & Mirakhor, 2011:46). The most contributive feature that Islamic banking could give to a creation of a just economy is the abolishment of Riba (usury). The abolishment of riba is intended to promote a just and upright economic behavior (Iqbal & Mirakhor, 2011:64). Riba may also indirectly create hostility, jealousy and grudges among men (Muhammad, 2004:24).

Islamic banking is also perceived as having better resilience in face of crisis than its conventional counterpart. Hasan & Dridi (2010) stated that in the year 2008 Islamic banking had better profitability than conventional banking. However, in the year 2009, the profitability of Islamic banking significantly declined when compared to conventional banking. The cause is believed to be a lack of good management.

On the other hand, Ouerghi (2014) states that the profitability of Islamic banking is below than conventional banking, and only have begun to rise after the crisis. It means that Ouerghi's research (2014) contradicted to Hasan & Dridi's (2010). Nevertheless, these two researches agreed upon Islamic bank's solvency that is better than conventional banks for periods during and after the crisis. Although normatively Islamic banking is supposed to have a better degree of resilience than conventional banking, this may not all be true positively. Even in Indonesia, the Islamic banking industry has already started to show its decline. For that reason, a comprehensive study on the industry is advisable. Additionally, strategic policy taken by the government is also crucial in supporting the growth of the Islamic banking industry in Indonesia.

While there hasn't been a conclusive study indicating the inefficiency of Islamic banks, this does not suggest that Islamic banks shouldn't pay attention to their performance. None of Islamic banks has failed due to their unique form of intermediation (Iqbal & Mirakhor, 2011:243).Nevertheless, lacks of good management and supervision have become  factors causing bank failures. A research on Islamic banks in UAE by Al Tamimi (2012) suggests that good corporate governance plays a significant role in the advent of *financial distress*.

Iqbal & Mirakhor (2011:238) states that there are failures of Islamic financial institutions which claimed to have offered Islamic financial products. Ismal (2013:333) added that both *withdrawal risk* and *bankruptcy risk* are the most important risks that Islamic banks in Indonesia have to face.

## LITERATURE REVIEW

### Financial Distress and Its Prediction Model

There has not been an agreed upon definition of financial distress from previous studies (Platt & Platt, 2006). The absence of a formal definition of financial distress puts into questions on the validity of researches conducted within the domain. Different measures of standards would categorize non distressed firms as distressed and vice versa; thus, without a formal definition of financial distress, it would be very difficult to address this problem (Platt & Platt, 2006).

Financial distress relates to a condition where a debtor (personal or institutional) is not able to fulfill its obligation towards its creditors (Ehab *et al.,* 2011). Financial distress often involves two parties, debtor and creditor; therefore, if financial distress is defined as a condition where a company could not fulfill its financial obligation, this will suggest that financial distress can only occur within companies using external funding (Outecheva, 2007). Outecheva (2007) categorizes financial distressed into three, namely: (1) event-oriented, (2) process-oriented, and (3) Technical.

In the first category, financial distress is mostly associated with terms such as default, failure and bankruptcy (Outecheva, 2007). Altman and Hotchkiss (2006:4) explain that various terms have been used to describe the formal and economic condition of a failing company. Four terms mostly used interchangeably are default, failure, insolvency and bankruptcy; even though these terms are often used interchangeably, formally each of them presents a different definition (Altman & Hotchkiss, 2006:4).

Failure, moreover, means that the realized rate of return on invested capital is significantly lower than prevailing rates on similar investments (Altman & Hotchkiss, 2006:4). It should be noted that a company may have had an economic failure for many years, yet never failed to meet its obligations (Altman & Hotchkiss, 2006:4). Insolvency, furthermore, is another term depicting negative firm performance, and is generally used in a more technical fashion; whereas technical insolvency may be a temporary condition although it is often the immediate cause of bankruptcy (Altman & Hotchkiss, 2006:5). Altman and Hotchkiss (2006:4-5) also defines that insolvency in bankruptcy sense is a condition where total liabilities exceed a fair value of total assets rendering the net worth of the firm negative.

Another corporate condition often associated with default distress can be technical and/ or legal and always involve the debtor-creditor relationship (Altman & Hotchkiss, 2006:5). Technical default takes place when the debtor violates a condition of an agreement with a creditor, and can be grounds for legal action (Altman & Hotchiss, 2006:5).

Bankruptcy may be understood as a formal process where a firm announces in court that it has gone bankrupt followed by the petition to liquidate its assets or to undergo a recovery program (Altman & Hotchiss, 2006:6). Zmijewski defines financial distress as an act of declaring bankruptcy within formal court, as a result, any company that has not been declared bankrupt within court cannot be categorized as financial distress (Wertheim & Robinson, 2011).

As for the second category, financial distress is defined as a process; this definition helps in understanding financial distress as a phenomenon in constructing a comprehensive theory of financial distress (Outecheva, 2007). Purnanandam (2007) states that financial distress is a process situated between solvent and insolvent, and considered as a condition where the company experiences low cash flow and losses without being insolvent.

The third category defines financial distress through indicators used by various financial distress prediction models (Outecheva, 2007). Though still criticized by many, the use of ratios in many financial distress prediction models is to produce results relating to the likelihood of financial distress and default within a company (Outecheva, 2007). In general, ratios that measure profitability, liquidity and insolvency are commonly used in predicting financial distress, despite not knowing which one is the most significant (Altman, 1968).

Poor management has always been the core reason behind financial distress within companies (Altman & Hotchkiss, 2006:13). Several non-internal factors, such as high interest rates, bad industrial performance, competition on the international level etc. may contribute to the occurrence of financial distress within a company (Altman & Hotchkiss, 2006:13). Ehab *et al.,* (2011) conducted a research regarding the potential of financial distress within banks in UAE. In the research, Ehab *et al.,* (2011) identifies several factors that are greatly relevant to financial distress, such as cost to income ratio as well as equity to asset ratio and non-performing loan ratio. Macroeconomic factors, on the other hand, do not play a significant role.

The applications of AltmanZ score on banks have previously been researched by several researches like Chotalia (2014) and Pradhan (2014) for banks in India and Al Zaabi (2011) in the UAE. Al Zaabi (2011) suggests that AltmanZ score is an analytical tool that may be applied in the banking industry. Additionally, Kusdiana (2014) states that AltmanZ score has better predicting capabilities than CAEL model when predicting bankruptcy.

However, several studies indicated the inappropriateness of Altman Z score in predicting financial distress within banks. A study conducted by Erari *et al.,* (2013) applied AltmanZ score model, CAEL model and bankometer model altogether within the Bank of Papua in Indonesia. The results showed that the results of Altman Z score model in many occasions were contradicted with the results of CAEL model. Altman Z score model was initially formed from an empirical study of manufacturing companies which is very much different from banking institutions (Endri, 2009).

## The Bankometer Model

The ability to predict which banks are vulnerable to financial distress is critically important for central banks, creditors and equity investors (Shar *et al.,* 2010). When a bank goes insolvent, creditors often lose portion of the principal and interest payments, while equity investors can potentially lose all of their investments (Shar *et al.*, 2010).

Therefore, It is important for management to focus more on trying to predict the banks that are vulnerable to financial distress in the near future by using bankometer model (Shar *et al.,* 2010). Ratios used within the bankometer model are ratios taken from CAMEL model and CSLA (*Credit Leona's Securities Asia*) stress test model with slight changes in their limits and percentages (Shar *et al.,* 2010).

S-Score = 1.5(CA)+1.2(EA)+3.5(CAR)+0.6(NPL)+0.3(CIR)+0.4(LA)

CA     = Capital to Asset Ratio
EA    = Equity to Asset Ratio
CAR   = Capital Adequacy Ratio
NPL   = Non Performing Loan Ratio
CIR   = Cost to Income Ratio
LA    = Loans to Asset Ratio
S     = SolvencyNote: <50 = Insolvent; 70< =Solvent; 50<S<70 = Grey Area
With criteria, CA>4%; EA>2% ;CAR>8%; NPL<15%; CIR<40%; LA<65%.

The main function of bank capital is to protect depositors in the case of liquidation and to protect the solvency of a bank in giving them cushions against losses so that the bank could remain operational (El Tibi, 2011:84). A capital adequacy ratio between 8% and 40% is an ideal number for a bank (Shar *et al.,* 2010). Meanwhile, the ideal number for capital to asset ratio is above 4% (Shar *et al.,* 2010). The higher the capital to asset ratio of a bank, the safer the bank is because it implies that the bank is funded by long-term funding (Erari *et al.*, 2013). The capital to asset ratio also shows how much asset is funded by non-internal funds (equity) (IMF, 2006:77). A higher equity to asset ratio is good for a bank because it indicates that the bank is well off from external funding (Erari *et al.,* 2013). The ideal number for equity to assets ratio is above 2% (Shar *et al.*, 2010).

NPL ratio, furthermore, shows how productive are the loans given by a certain bank (Erari *et al.,* 2013). According to Shar *et al.,* (2010), the ideal number for NPL ratio is below 15%. Meanwhile, loans to asset ratio shows how much assets are used for credit lending; the higher the ratio, the better it is for a bank's profitability, but it may affect the liquidity of the bank negatively (Erari *et al.*, 2013). The ideal number of loans to asset ratio is below 65% (Shar *et al.,* 2010).

A low cost to income ratio would contribute to a higher profitability for a bank (Erari *et al.*, 2013). An ideal number for cost to income ratio is below 40% (Shar *et al.,* 2010). Relating to bankometer score, Shar *et al.,* (2010) explains that banks with bankometer score exceeding 70 may be categorized as *super sound banks.*

Several researches have applied the bankometer model within different countries, such as in Srilanka by Nimalathasan *et al.,* (2012) and Arulvel & Balaputhiran (2014), in Pakistan by

Shar *et al.,* (2010) and Hanif *et al.,* (2012), in Egypt by Fayed (2013) and in Macedonia by Popovska (2014). Erari *et al.,.* (2013) states that the bankometer model is more appropriate to use within banks than AltmanZ score model, and it is also easier to apply than CAEL model.

# RESEARCH METHODOLOGY

## Population and Sample

This research used purposive sampling in order to determine its samples. Samples consisted of 4 full-fledged Islamic banks: BNI Syariah, Bank Muamalat, Bank Mega Syariah, Bank Syariah Mandiri and 10 conventional banks which total assets are above 2,5 billion rupiah and below 50 billion rupiah in the year 2010, namely Bank Artha Graha, Bank Bumiputera, Bank Ekonomi Raharja, Bank Nusantara Parahyangan, Bank ICBC Indonesia, Bank Mutiara, Bank Bumi Arta, Bank Sinarmas, Bank UOB Buana, and Bank Mayapada.

## Technique of Analysis

In order to compare financial distress prediction between Islamic and Conventional banks, several steps of analysis were taken :

1. Calculate the *capital to assets, equity to assets, capital adequacy, non-performing loan/financing, cost to income,* and *loans to assets* of all sampled banks for the year period of 2011-2014.

2. Calculate the bankometer scores of all sampled banks during the period of observation.

3. Categorize the bankometer scores into two groups, namely Islamic banks and Conventional banks.

4. Asses the normality of the two grouped bankometer scores.

5. Compare the means of the bankometer scores of Islamic banks and conventional banks by using statistical independent sample t-test.

Samples could be stated independent if a clear line could be drawn between the samples; to analyze two independent samples which data types were ratio/interval, the t-test independent sample was used (Siregar, 2013:178). The steps of conducting the independent sample t-test were as follow (Siregar, 2013:178-179).:

1. Asses the normality of the data.
   $H_0$ : Data are normally distributed
   $H_1$ : Data are not normally distributed

2. Conduct homogeneity test
   $H_0$ : The variance are assumed to be the same
   $H_1$ : The Variance are not assumed to be the same

3. Determine the hypothesis, in this research the hypothesis was stated as follow $H_0 : X_1 = X_2$ (no significant difference between the mean of Islamic banks' bankometer scores and the mean of conventional banks' bankometer scores). Meanwhile, the alternative hypothesis was $H_1 : X_1 \neq X_2$ (significant difference between the mean of Islamic banks' bankometer scores and the mean of conventional banks' bankometer scores).

4. Determine the degree of confidence. This step determines the probability of making the mistake of rejecting the correct hypothesis. The level of confidence desired in this research was 95%.

5. Conduct the testing rules, if $-t_{table} \leq t_{score} \leq tt_{abel}$ then $H_0$ was accepted. If $t_{score} > t_{table}$ then $H_0$ was rejected.

Formula of T-score :

$$\frac{\mu1 - \mu2}{\sqrt{\frac{(n1-1)S_1^2 + (n2-1)S_2^2}{n1+n2-2}\left(\frac{1}{n1} + \frac{1}{n2}\right)}}$$

6. Compare the t-score to that of t-table

7. Make a Decision

## DISCUSSION

### Test of Normality

Table 1 provides the results of Kolmogorov Smirnov test. The results show that the p value of both datasets (Islamic and Conventional) was more than 0.05 (0.2 > 0.05). Thus, it could be concluded that both datasets were normally distributed.

Table 1. The Results of Normality Test on Islamic and Conventional banks' bankometer scores

|  | Kolmogorov-Smirnov (Sig.) | Rules of Testing | Results |
|---|---|---|---|
| IB | 0.2 | P Value > 0.05 ($H_0$ accepted) | $H_0$ accepted (0.2 > 0.05) |
| CB | 0.2 | P Value > 0.05 ($H_0$ accepted) | $H_0$ accepted (0.2 > 0.05) |

Source: Research results, 2015

$H_0$: Data are normally distributed

$H_1$: Data are not normally distributed

## Test for Homogeneity of Variance

Table 2. The Results of Test for Homogeneity of Variances

| Levene's Test for Equality of Variance | Rules of Testing | Results |
|---|---|---|
| 0.731 | P value > 0.05 ($H_0$ accepted) | 0.731 > 0.05 |
| | P value < 0.05 ($H_0$ accepted) | ($H_0$ accepted) |

Source: Research Results, 2015
$H_0$: The Two Variance Are the Same
$H_1$: The Two Variance Are Not the Same

Based on the results of test for homogeneity of variance in Table 2, it could be noted that the p value of 0.731 was more than 0,05. Thus it could be concluded that the variance of both datasets was the same and the T test was conducted under that assumption.

## Hypothesis Testing

Table 3 provides the results to test the hypothesis in this research. T test was used to see whether or not there was a significant difference between the bankometer scores of Islamic banks and those of Conventional banks in Indonesia for the period of 2011-2014.

$H_0$: $X_1 = X_2$ (no significant difference between the bankometer scores of Islamic banks and those of conventional banks).

$H_1$: $X_1 \neq X_2$ (a significant difference between the bankometer scores of Islamic banks and those of conventional banks).

The testing was conducted with a confidence degree of 95%. The testing ruleswere, if $-t_{table} \leq tscore \leq t_{table}$ or P Value > 0.05 then $H_0$ was accepted. If tscore > $tt_{able}$ or P Value < 0.05 then $H_0$ was rejected.

Table 3. The Results of Independent Sample T Test

| T Score | T-Table | Result |
|---|---|---|
| -1.008 | 2.005 | Ho accepted (-2.005 < -1.008 < 2.005) |

Source: Research Results, 2015

From above results, the acquired T score was -1.008. The T score was negative due to the fact the mean of the first category (Islamic banks' bankometer scores) was lower than the mean of the second category (Conventional banks' Bankometer scores). The next step was to search for the T table with a freedom degree of 54 and significance level of 0.025 (0,5/2)., The acquired value for the T table was 2.005. Therefore, according to the rules of testing, the result was -2.005 < -1.008 < 2.005. The result could also be acquired by taking account of the P value. Based on the results, it is noted that the P value was 0.318, ( > 0.05).

Therefore, with a confidence degree of 95%, it could be concluded that Ho was accepted. The result suggests that the mean of Islamic banks' bankometer scores (134.052) was not significantly different from the mean of conventional banks' bankometer scores (138.455).

# FINDINGS

## Bankometer Score

Table 4. The Means of The Bankometer Scores

|                          | 2011  | 2012  | 2013   | 2014  |
|--------------------------|-------|-------|--------|-------|
| Overall Mean             | 132.4 | 131.9 | 141.83 | 142.5 |
| Islamic Bank's Mean      | 130.5 | 129.1 | 132.1  | 144.4 |
| Conventional Bank's Mean | 133.3 | 133   | 145.7  | 141.8 |

Source: Research Results, 2015

Shar *et al.,* (2010), in formulating the bankometer model, several standards for each component of the model was set up.

1. Capital Adequacy Ratio = 8% < CAR < 40%

2. Capital to Asset Ratio = 4% < CA

3. Equity to Asset Ratio = 2% < EA

4. NPL/NPF = NPL/NPF < 15%

5. Cost to Income Ratio = CIR < 40%

6. Loans to Asset Ratio = LA < 65%

Banks that are able to fulfill the given standards will be easily identified as super sound banks (Shar *et al.,* 2010). In pertinence to the bankometer score, Shar *et al.,* (2010) explains that banks with bankometer scores above the cut off value of 70 (70 < S Score) are considered to be solvent and not vulnerable to financial distress.

In calculating the bankometer scores of all sampled banks throughout the periods, it is known that none of those banks had a bankometer score below the cut off value determined by Shar *et al.,* (2010). This suggests that those banks were solvent and not prone to financial distress according to the bankometer procedure. In regards to the components of the bankometer model, all banks have also fulfilled the standards set up by Shar *et al.,* (2010), except for the components of cost to income ratio and loans to asset ratio.

All of those banks, moreover, had a cost to income ratio above the standard set up by shar *et al.,* (2010). This suggests that, according to the standards set up by shar *et al.,* (2010), these banks were lack of efficiency. However, the failure to meet the standards determined for the bankometer model's components does not close the possibility of attaining a satisfied bankometer score. Similar cases have been shown in a previous study conducted by Hanif *et al.,* (2012) in which Islamic banks in Pakistan, despite having cost to income ratio above the determined standard and being below in efficiency compared to conventional banks, managed to attain bankometer scores higher than the latter. However, a study done by Pappas *et al.,* (2012) shows that cost to income ratio plays a significant role in the advent of failure risk for Islamic banks.

All sampled Islamic banks have had loans (financing) to asset ratio above the pre-determined standard in all periods of observation, except BNI Syariah in the year period of 2011. On the other hand, numerous conventional banks have succeeded in fulfilling this standard. This shows that conventional banks have a generally better liquidity than Islamic banks. A higher financing to asset ratio in Islamic banks compared to conventional banks' loans to asset ratio could also be found in other countries. For instances, studies conducted by Fayed (2013) in Egypt and Hanif *et al.,* (2012) in Pakistan show that in general, conventional banks have better liquidity than Islamic banks. Another study done by Abdul Rahman & Masngut (2014) for banks in Malaysia also shows the same result.

It is difficult to remark a trend from the bankometer scores obtained in this study. The reason is that the bankometer score is highly influenced by capital adequacy ratio changing from year to year (Erari *et al.,* 2013).

### Comparison of The Bankometer Scores

The independent sample T test yielded a score of -1.008. The negative T score shows that the first group (Islamic banks' bankometer scores) had a lower average than that of the second group (conventional banks' bankometer scores). The results from the testing suggests that there was no significant difference between Islamic banks's bankometer scores and conventional banks' bankometer scores for the year period of 2011-2014.

Based on the test's result, there was no significant difference. It indicates that Islamic banks had more or less resilience towards financial distress than conventional banks. This result is similar to that of a study conducted by Gamaginta & Rokhim (undated) which also gauged financial distress between Islamic banks and conventional banks with Z-score Model for the year period of 2009. This result, however, contradicts to that of Pappas *et al.,* (2012) which studied the failure risk of observed 421 banks in the Middle East and East Asia countries for the year period of 1995-2010., Their research results suggest that Islamic banks are 55% less hazardous to failure than conventional banks. It is because of the high amount of leverage within conventional banks. On the other hand, various factors affect the failure risk for Islamic banks, one of which influence strongly is inflation (Pappas *et al.,* 2012).

High bankometer scores above the cut off value obtained by banks in Indonesia indicate fine resilience of Indonesia's banking industry towards financial distress in general. For Islamic banks in particular, a fine level of resilience towards financial distress is also shown in previous studies conducted by Hanif *et al.,* (2012) and Abdul Rahman & Masngut (2014).

## CONCLUSION

Based on the calculation of the bankometer scores of all bank samples, all banks had a fine level of resilience against financial distress since all of their bankometer scores were more than 70, as the cut off value. It means that none of these banks was predicted to experience financial distress in the future or insolvency. The satisfactory bankometer scores obtained by the banks also indicates good capital performance of the banking industry in Indonesia.

The cost to income ratio and the loans to asset ratio (financing to asset ratio for Islamic Banks) show that efficiency and liquidity performances require further attention. The components of the bankometer model also describe that all of them were at the safe level, which means that they all met the standards given by the bankometer procedure.

The results of the Independent sample T test, finally, showed that there was no significant difference of the bankometer scores between Islamic banks and conventional banks (P Value > 0.05). It indicates that both Islamic and conventional banks have more or less than the level of resilience against financial distress. It also indicates that Islamic banks have capital structures similar to their conventional counterpart's. This similarity show that, at least in Indonesia, Islamic banks are not in any way less susceptible to financial distress or insolvency than conventional banks.

Moreover, This result also confirms finding Gamaginta & Rokhim (undated), but contradicts to that of Pappas *et al.,* (2012) who concluded that Islamic banks are 55% less hazardous to failure than conventional banks. Main factor that may cause conventional bank has higher level of hazardous to failure is its high amount of leverage. In term of fine level of resilience towards financial distress, this research has similar finding with Hanif *et al.,* (2012) and Abdul Rahman & Masngut (2014).

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