

ABSTRAK

PENERAPAN MODEL *SIMPLE HAZARD* UNTUK MEMPREDIKSI KEBANGKRUTAN PADA BANK DI INDONESIA

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Penelitian ini membuktikan Model *Hazard* sebagai *early warning system tool* yang akurat untuk prediksi kebangkrutan, khususnya pada bank yang gagal di Indonesia, juga diketahui faktor yang signifikan berpengaruh dalam kebangkrutan. Sampel penelitian yaitu bank sehat 15 bank, bank tutup/bermasalah 11 bank. Variabel Dependen (Y) berupa variabel *binary*, bernilai 1 untuk bank tutup/bermasalah dan 0 untuk bank sehat atau tidak berisiko. Variabel Independen (X) yaitu CAR, NPL, LDR, ROE, ROA, NIM dan BOPO. Penelitian ini dianalisis dengan Model *Hazard* yaitu sebuah model ekonometrika yang digunakan untuk mengukur *probability of default* dan *distress* bank. Tahap analisa data, yaitu: (1) Analisis deskriptif, (2) Uji multikolinearitas, (3) Estimasi pemodelan dengan **fungsi regresi logistik berganda/binary**, (4) Evaluasi model.

Analisis deskriptif pada bank sehat dan bank gagal menunjukkan hasil yang sesuai dengan kondisi data pada dua kategori bank tersebut. Hasil uji multikolinearitas menunjukkan tidak terjadi multikolinearitas pada variabel yang diujikan. Jumlah data diproses adalah 199 dengan 4 *missing cases*. Klasifikasi data atau *overall percentage* pada penelitian ini meningkat signifikan dari 79,4% menjadi 89,9%. Hasil uji *Goodness of Fit* menunjukkan nilai $-2 \text{ Log Likelihood} < \text{Chi Square}$ tabel, model adalah layak (*perfect-fit*). *Hosmer and Lameshow Test* menunjukkan probabilitas signifikansi $> 0,05$ semua model dapat diterima. Pada Uji *Overall Model Fit* terjadi penurunan *Likelihood* menunjukkan model regresi yang lebih baik atau model yang dihipotesiskan fit dengan data. *Cox & Snell R Square* sebesar 0,407 dan Nilai *Nagelkerke R Square* sebesar 0,638 menunjukkan kemampuan variabel independen dalam memprediksi bank sakit dan bank sehat adalah sebesar 63,8% dan terdapat 36,2% faktor lain di luar model yang menjelaskan variabel dependen. Hasil Uji *Wald* menunjukkan NPL, ROA, BOPO dan NIM signifikan secara parsial terhadap Y, CAR, LDR dan ROE tidak signifikan secara parsial terhadap Y. Persamaan regresi berikut menghasilkan *Predicted Probability* 1 terjadinya bank gagal adalah pasti terjadi, hasil uji pada data 1 tahun sebelum bangkrut adalah 81,8% bangkrut.

$$\ln \frac{p}{1-p} = -38,520 - 2,770 \text{ CAR} + 29,771 \text{ NPL} + 290,436 \text{ ROA} + 1,871 \text{ LDR} + 2,116 \text{ ROE} + 36,326 \text{ BOPO} - 46,075 \text{ NIM}$$

Seluruh pendekatan evaluasi model memberi hasil yang baik, sensitif dan dapat menjelaskan prediksi kebangkrutan dengan baik. Analisis Model *Hazard* menunjukkan NPL, ROA, BOPO dan NIM secara parsial signifikan, sedangkan tiga variabel lain yakni CAR, LDR, ROE secara parsial tidak signifikansi terhadap

kebangkrutan bank. *Likelihood ratio* dan *Odds ratio* dari hasil uji Model Hazard menunjukkan bahwa bank gagal dapat diprediksi bermasalah sebesar 98,42% dan variabel independen dapat menjelaskan prediksi tersebut sebesar 63,8%.

Kata kunci: *Simple Dynamic Hazard, Simple Hazard Model, Model Hazard, Early Warning System, Kebangkrutan, Probability of default, Probability of distress, Regresi Logistik Binary, Predicted probability.*

ABSTRACT

SIMPLE HAZARD MODEL IMPLEMENTATION TO PREDICT BANK'S BANKRUPTCY IN INDONESIA

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This study has proved that Hazard Model was an accurate early warning system tool for bankruptcy predictions, especially for default banks in Indonesia and also to identify significant factors influenced those bankruptcy. The research samples consist of 15 healthy banks and 11 default banks. Dependent Variables (Y) develop in the form of binary variables, 1 for default banks and 0 for healthy or non-risk banks. Independent variables (X) include in this study are CAR, NPL, LDR, ROE, ROA, NIM and BOPO. This study was analyzed with the Hazard Model which is an econometric model used to measure the probability of default and distress of a bank. The data was analyzed with some phases: (1) Descriptive analysis test, (2) Multicollinearity test, (3) Modeling estimation which is using binary logistic regression, (4) Evaluation of the model.

Descriptive analysis on healthy banks and default banks show results that match the real data conditions in those categories. Multicollinearity test results showed no multicollinearity on the variables tested. The amount of data processed is 199 with 4 missing cases. Data classification or overall percentage in this study increased significantly from 79.4% to 89.9%. Goodness of Fit test results show the value of $-2 \text{ Log Likelihood} < \text{Chi Square}$ in table list, the model is feasible (perfect-fit). The Hosmer and Lameshow Test shows a significance probability > 0.05 and all models are acceptable. Overall Model Fit Test showed that there was a decrease in the Likelihood value, which is indicating a better regression model or the model were hypothesized fit with the data. Cox & Snell R Square value is 0.407 and Nagelkerke R Square value is 0.638, those value indicate the ability of independent variables in predicting bank's bankruptcy and non-risk banks. The Value showed is 63.8% and there are 36.2% factors other than the model that explain the dependent variable. Wald Test results show that NPL, ROA, BOPO and NIM are partially significant on Y, CAR, LDR and ROE are not partially significant on Y. The following regression equation showed that Predicted Probability value is 1, that means the occurrence of default bank is inevitable. The test results on the data 1 year before the bankruptcy is 81.8% proved that the bank bankrupt.

$$\ln \frac{p}{1-p} = -38,520 - 2,770 \text{ CAR} + 29,771 \text{ NPL} + 290,436 \text{ ROA} + 1,871 \text{ LDR} + 2,116 \text{ ROE} + 36,326 \text{ BOPO} - 46,075 \text{ NIM}$$

All model evaluation approaches used give good results. It was proven that the model was sensitive and clearly explain bankruptcy predictions. Hazard Model Analysis shows that NPL, ROA, BOPO and NIM are partially significant, while three other variables CAR, LDR, ROE is partially insignificant to bankruptcy. The likelihood ratio and Odds ratio of the Hazard Model test results indicate that

default bank can be predicted with a score of 98.42% and the independent variable can explain the prediction as much as 63.8%.

Keywords: *Simple Dynamic Hazard, Simple Hazard Model, Hazard Model, Early Warning System, Bankruptcy, Probability of default, Probability of distress, Binary Logistic Regression, Predicted probability.*