

## Predicting Indonesia External Debt Crisis: An Artificial Neural Network Approach

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**Abstract :** In this study, we compared the performance of the Artificial Neural Network (ANN) model with back-propagation algorithm in correctly predicting in-sample and out-of-sample external debt crisis in Indonesia. We found that exchange rate, foreign reserves, and exports are the major determinants to experiencing external debt crisis. The ANN in-sample performance provides relatively superior results. The ANN model is able to classify correctly crisis of 89.12 per cent with reasonably low false alarms of 7.01 per cent. In out-of-sample, the prediction performance fairly deteriorates compared to their in-sample performances. It could be explained as the ANN model tends to over-fit the data in the in-sample, but it could not fit the out-of-sample very well. The 10-fold cross-validation has been used to improve the out-of-sample prediction accuracy. The results also offer policy implications. The out-of-sample performance could be very sensitive to the size of the samples, as it could yield a higher total misclassification error and lower prediction accuracy. The ANN model could be used to identify past crisis episodes with some accuracy, but predicting crisis outside the estimation sample is much more challenging because of the presence of uncertainty.

**Keywords :** debt crisis, external debt, artificial neural network, ANN

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