

AUC Maximization Method in Credit Scoring ^{*}

Kakeru Miura [†] Satoshi Yamashita [‡] Shinto Eguchi [§]

Abstract

The Receiver Operating Characteristic (ROC) curve and Area Under the Curve (AUC) is widely used in credit risk scoring. In this area, logit model is most used with the parameters estimated by ML (maximum likelihood) method. The accuracy of this model is measured by AUC. However, the logit model, estimated by ML method, generally dose not have optimality in AUC. We propose a new method which is a different way of using AUC. Our purpose is to estimate parameters and the model such that maximizes AUC by using approximated AUC as the objective function. We obtain results showing that the model is not only optimal in AUC but also more robust than the logit model when applied to data sets including an outlier. Financial indicator data often include some outliers and our new method is essentially effective from the point of robustness. Financial data are frequently less reliable just before the default and robustness to some outliers forms a very important element of an adequate method.

keywords: **ROC curve, AUC, linear scoring, sigmoid function**

^{*}This paper represents the authors' personal views, which are not necessarily the official ones of the Financial Research and Training Center or the Financial Services Agency.

[†]The Graduate University for Advanced Studies, Financial Services Agency Government of Japan (E-mail:kmiura@ism.ac.jp)

[‡]The Institute of Statistical Mathematics, Financial Services Agency Government of Japan (E-mail:yamasita@ism.ac.jp)

[§]The Institute of Statistical Mathematics (E-mail:eguchi@ism.ac.jp)