

Two Numbers Are Better Than One: A Two-Dimensional Approach to Evaluating Scorecard Discriminatory Power

Abstract

The Area Under the ROC Curve (AUC) or its linear transformation, the Gini coefficient, is a widely used metric for assessing the discriminatory power of scoring models in retail banking. However, as previous research has shown, AUC alone may overlook important nuances of model performance, particularly those arising from differences in the shape of the ROC curve.

Some authors have proposed alternative single-number summaries beyond AUC/Gini, incorporating misclassification costs, expected profits, or performance at specific cutoffs. This presentation instead advocates for a two-number approach to summarizing separation power: (1) AUC (or Gini) as the first measure and (2) a second metric that captures the shape of the ROC curve.

A promising candidate for this second metric is the shape parameter derived from fitting a binormal model to the empirical ROC curve. Research suggests that the two-parameter binormal model effectively represents ROC curves in credit scoring and other machine learning applications.

We discuss the rationale for the two-number approach, explore alternative candidates for the second metric, and demonstrate its benefits using real-world and simulated examples. When adopted, this framework can enhance institutional understanding of credit scoring models, ultimately supporting better decision-making in risk and profitability management within lending businesses.

Full Paper

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