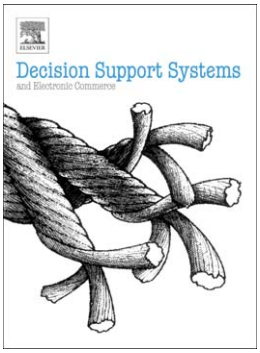

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Solvency Prediction for Small and Medium Enterprises in banking

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Abstract

This paper describes novel approaches to predict default for SMEs. Multivariate outlier detection techniques based on Local Outlier Factor are proposed to improve the out of sample performance of parametric and non parametric models for credit risk estimation. The models are tested on a real data set provided by UniCredit Bank. The results at hand confirm that our proposal improves the results in terms of predictive capability and support financial institutions to make decision. Single and ensemble models are compared and in particular, inside parametric models, the generalized extreme value regression model is proposed as a suitable competitor of the logistic regression.

Keywords: Credit Risk, Probability Default, Binary Generalized Extreme Value Model, Ensemble, Multivariate Outlier Detection.

1. Introduction

It is well known that Basel II and Basel III [1] established that banks should develop credit risk models that are specific for SMEs [2]. Statistical models to measure the default probability in credit risk have a long history but, understandably, they have received an increasing attention in correspondence with the Basel II framework delivery in the 2000. There is a wide statistical literature in this field focused on risk prediction methods for SMEs (e.g. [2, 3, 4, 5]). More precisely, machine learning methods, data mining algorithms,

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