



A comparison of strategies to develop a customer default scoring model

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Behavioural scoring models are generally used to estimate the probability that a customer of a financial institution who owns a credit product will default on this product in a fixed time horizon. However, one single customer usually purchases many credit products from an institution while behavioural scoring models generally treat each of these products independently. In order to make credit risk management easier and more efficient, it is interesting to develop customer default scoring models. These models estimate the probability that a customer of a certain financial institution will have credit issues with at least one product in a fixed time horizon. In this study, three strategies to develop customer default scoring models are described. One of the strategies is regularly utilized by financial institutions and the other two will be proposed herein. The performance of these strategies is compared by means of an actual data bank supplied by a financial institution and a Monte Carlo simulation study.

Journal of the Operational Research Society (2016) 67(11), 1341–1352. doi: 10.1057/jors.2016.23;
advance published online 20 April 2016

Keywords: credit risk; credit scoring; customer scoring; generalized estimating equations; logistic regression

1. Introduction

Credit concession is one of the main services provided by financial institutions. In order to make it a profitable business, it is important that banks perform efficient credit risk management. Credit scoring models are fundamental tools in this process. These models aim to measure the risk associated with a credit operation or a customer. Traditionally, credit scoring models are divided into two categories: application scoring and behavioural scoring. The former is used in the decision-making process of product concession to a new customer, the latter is utilized in risk assessment of existing operations. Thomas (2009), Anderson (2007) and Finlay (2012) describe several aspects related to these models in detail, and a summary of the contributions to this area is presented in Abdou and Pointon (2011).

Traditionally, behavioural scoring models are used to estimate the probability that a customer who has already purchased a certain product will default on this product in a fixed time horizon. These models mainly use variables related to a customer's product utilization behavior. Demographic variables and information on a customer's credit behavior in other financial institutions made available by credit bureaus are also used. Several methods can be used to develop such models and logistic regression is usually

adopted (Thomas, 2010). Also, behavioural scoring models may be developed to fit time until default takes place by means of survival analysis methods (Stepanova and Thomas, 2001; Cao *et al.*, 2009; Sarlija *et al.*, 2009).

A financial institution has several credit products. Often times, however, behavioural scoring models treat each product independently (Thomas *et al.*, 2001). Nevertheless, it may be interesting for a bank to focus on its customers, not on its products. Customer-oriented credit risk management brings various advantages. It prevents, for instance, the concession of a new product or the increase of an existing reserve line of credit to customers who do not make timely payments or who have low credit score regarding other products. It also allows a better control over total credit reserves available and values loaned to customers, thus avoiding granting customers more credit than they can bear.

As customer focus has become the order of the day, consolidating customer credit risk into separate products (given by behavioural scoring models) in a single measure has also become a worry, giving rise to customer default scoring models or simply customer scoring (McNab and Wynn, 2003). These models aim to order customers regarding the probability of defaulting on at least one product in a fixed period of time. The greatest advantage of this tool is to allow a broader view of customer risk, thus enabling the creation of proper credit policies for the financial institution. A bank that has, for instance, three behavioural scoring models for their products will give each customer one vector of scores with three positions. As a result, the financial institution may have great

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