Statistical Techniques for Parameters Estimation That Involved in Individual-Based Pricing of Credit Card Holders

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Abstract

The notion of risk-based pricing is that a lender quotes a lower rate to its less risky applicants and a higher rate to its more risky ones. By this process, the lender takes into consideration only the risk profile of any customer, as it is assessed by his or her creditworthiness analysis at the beginning of the relationship. However, in some loan products, calculations are more complex. In additional, in loan products with floating interest rate, the lender should periodically monitor the customer in order to change the interest rate if it has to. For a profitable business, however, the lender should not only monitor customer creditworthiness, but also his or her behavior and possible response to an interest rate change.

Problems exist in revolving credit products, like credit card, where the amount borrowed is not known in advance and varies over time. In addition, the return for a credit card issuer doesn't stem only from borrowed amount. It also earns from transactions, through commissions, and from annual fees as well. Therefore, assessing only the risk profile of a credit cardholder is not sufficient for a proper interest rate quoting and profitable business at all.

Actually, in order to assess the value that a cardholder adds to the card issuer's portfolio, many factors should be considered and there is a number of parameters to be estimated for each customer individually. For example, the lender should estimate, expect of the customer risk profile, his or her usage rates, in terms of borrowed amount and transactions amount, probability of being a revolver, attrition rate, sensitivity in interest rate change etc.

In this paper, we propose some statistically methodologies that can be used in order to effectively estimate all these parameters concerning not the risk profile of the customer, but the total value that stems from the right interest rate quoting. We will deal with credit card customers and apply these methodologies to a real set of data.

Keywords: risk-based pricing; credit card; credit scoring; behavioral scoring; profit scoring

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