Chapter 3

Assessing Financial Well-Being of Merchants by Analyzing Behavioral Patterns in Historical Transactions

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ABSTRACT

This study focuses on a new approach to estimate financial wellbeing indicators for merchants, by looking at behavioral patterns of their customers using transaction history. The transaction data for about 10,000 merchants in a specific country, was analyzed in terms of diversity and propensity of their customers using factors like age, distance travelled to shop, time of the day for shopping, day of the week for shopping, educational status, gender etc. These factors were used as independent variables to predict the financial well-being of merchants, particularly in two dimensions – total revenue and consistency in revenue, both relative to other merchants in the same industry. The merchants were then also divided into the categories of Essential, Non- essential and Luxury goods depending on the industry they belong to and it was interesting to observe the contrast across categories. The results suggest that behavioral patterns could be used to augment current methods of calculating credit score.

INTRODUCTION

Estimating Credit risk is one of the core activities for banks, whether they are lending to individuals or corporations. Different type of credit scoring models are used for the purpose so that the risk estimation process becomes standardized and fair, pricing decisions could be made and provisions can be made for anticipated losses. Different customers present different kind of risk and return profiles to the bank and the key is to strike the right balance.

Credit scoring for individuals use factors like type of credits used, payment history, outstanding balance, highest balance drawn on the account etc. It may also use publicly available information such as liens, bankruptcy, criminal record etc. The credit score for a company in Small and Medium Enterprise category would use a different set of inputs like Total Sales, Debt Equity Ratio, Average Bank account balance, Type of collateral, industry specific risk and dependencies on Suppliers etc. (Division of Supervision and Consumer Protection, 2007).

The credit scoring models have been in the process of constant evolution. Starting with a checklist of health indictors, they now incorporate prediction of consumer behavior, probability of default and likelihood of account attrition. Institutions now even combine the results of different type of credit scoring models before they arrive at a decision. (Risk Rating and Credit Scoring for SMEs, 2012)

While many studies have linked the social behavior of people to their economic well-being or financial behavior, we have attempted to look at a similar problem but in a different context. In this study, we try to establish the link between the economic wellbeing of merchants and the behavioral patterns of their customers. If a bank has to extend credit to a merchant, can it make some conclusions from the historical transactions for that merchant? What kind of customer behavior patterns or factors in historical data could be important? And would these patterns be consistent for all kind of merchants or does it differ from category to category? We tried to answer some of these questions. The outcome of this study does not intend to replace any existing credit scoring methods but to augment them with a new perspective.

We had over 5 million records of credit card transaction data for about 10,000 merchants in a specific country. We tried to profile the customers of the different merchants in terms of their diversity and propensity in specific factors like age, distance they travel to shop, time of the day, day of the week, educational status, gender etc. While diversity refers to the variety in the different groups, propensity refers to concentration of customers in specific groups. We have used these factors as independent variables to predict the financial well-being of merchants. Specifically, we have measured financial well-being of a merchant by two factors – total revenue and consistency in revenue, both relative to other merchants in the same industry.

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