MMF Risk Management – Dec 11, 2022

Retail Credit Risk Modeling Assignment

# Develop a Small Business behavior score. Document all of the steps and results in the model development process.

1. INTRODUCTION (Please limit responses to one paragraph per question)

Provide information on the purpose of the model, portfolio overview, model use, economic and market outlook, and overview of the model development process

Include the following

* 1. PURPOSE

The purpose of this document is to provide a detailed description Small Business Behavioural Score. This document should provide the rationale for model development, including details about model limitations and assumptions, source data, development process, and model assessment.

* 1. PORTFOLIO

What is the composition of the Small Business portfolio according to the attached dataset?

1.3 MODEL USE

Please outline how a Small Business model would be used within a Financial Institution.

* 1. ECONOMIC AND MARKET OUTLOOK

Please provide brief summery on outlook and the impact.

* 1. MODEL DEVELOPMENT PROCESS

Describe model development process

2.0 DATA

2.1 DATA SOURCES

Describe data sources used in this model development

2.2 TIMEFRAMES

Determine and document modeling timeframes

2.3 TARGET VARIABLE DEFINITION

Create target variable using point in time default variables in dataset, and document definitions.

2.4 POPULATION EXCLUSIONS

Exclude Widely Held customers and deceased customers.

Why it is important to exclude deceased customers?

How many customers are in the population before exclusions?

How many are excluded?

What impact do exclusions have on the volumes?

2.5 MODELING POPULATION

How many customers are in default and not default? What is the default rate? Show results for total population as well as by observation points

2.6 EXPLANATORY VARIABLES

Create new variables using Monthly Debit and Credit Transactions. Please give rational for your variable creations.

2.7 SEGMENTATION

What type of segmentation can be considered?

Can you segment this population?

2.8 SAMPLING METHODOLOGY

Create Training/Validation and out of time validation samples

How do you know what samples are not biased?

3.0 SCORECARD DEVELOPMENT

3.1 Modeling Considerations

Why the modeling technique is appropriate

3.2 Variable Reduction

3.2.1 Pre-Screening

How many explanatory variables you have in your data set?

Exclude variables based on business considerations? Please provide rationale.

3.2.2 Univariate Screening

Bin variables created in 2.6

Create WOE and IV for variables in previous step.

Calculate IV for all explanatory variables based on information provided in the file.

Use all variables in the sample to filter out not significant variables

How many variables were removed?

Pick one significant and one non-significant variable and discuss what happens to default rates, WOE as the variable changes?

3.2.3 Multivariate screening

Perform variable clustering and describe the results

How many clusters were created? Pick two clusters and explain what type of information they contain

How many variables proceed to the next step?

3.3 Model Fitting

Fit stepwise logistic regression; describe what variables made it into the final model what they represent, what are the data sources, describe each trend and discuss why this trend is appropriate.

3.4 Scorecard Scaling

Describe how you scaled scorecard and show final result

3.5 SCORECARD ASSESSMENT

3.5.1 Rank-Ordering

Calculate KS and AR show result for each sample and time period. Include Lift at 10%

3.5.2 Population Stability

Show stability of the final score through time

3.5.3 Scorecard Benchmarking

Develop a benchmark model using a different technique – eg: CHAID

Compare model performance using AR, KS and lift at 10%.

4.0 MODEL LIMITATIONS AND ASSUMPTIONS

Discuss model limitations and assumptions