

Loan Analysis

Background

Using the Universal Bank data, determine the factors which influence whether a customer takes out a loan

Resources

Use the dataset SCM 651 Homework 4 Universal Bank.csv.

Assignment

What's due:

Submit a logit, probit, and neural network analysis of loan acquisition behavior **before the live class in week 10**. Suggested length is five pages, but should not exceed ten pages, single-spaced, 12-point font.

This is a group assignment; each student should upload a copy of the assignment to the Learning Management System. The paper must be a Microsoft Word document. You should also submit the Excel spreadsheet with the prediction models and sensitivity analyses. Name the file HW4_Team# where # is your team number. Be sure to include the names of everyone on the team on the first page of the paper. Late assignments will not be accepted. Failure to follow directions will be penalized.

Outline and grading criteria:

1. Perform a logit and probit analysis of the variables that affect whether a customer takes out a loan. Consider only main effects. Which variables are significant? How do the significant variables influence the likelihood of taking out a loan? Copy screen snapshots of your analysis in R to your report. (20%)
2. Add moderating effects (interactions of variables). Which interactions make sense conceptually? Which interactions are statistically significant? How do you interpret the coefficients on these variables? Copy screen snapshots of your analysis in R to your report. (20%)
3. Create a final regression model with the variables that you feel are important (both main effects and interaction terms). Create a spreadsheet prediction of the model. Which variables have the greatest influence on the customers' loan behavior (combined main effects and interaction effects)? Perform a sensitivity analysis as seen earlier in the semester. Copy screen snapshots of your analysis in R to your report. (20%)
4. Perform a neural network analysis of the variables found to be significant in the logit and probit analysis above. Copy screen snapshots of your final neural network model in R to your report. (20%)
5. Create a prediction model of the neural network. Using the prediction model, perform a sensitivity analysis for the neural network model similar to the logit and probit sensitivity analysis. (20%)

Justify your answers. Provide a snapshot of output from your analysis in your final paper.

SCM 651: Business Analytics

Universal Bank Data Fields

ID	unique identifier
Personal Loan	did the customer accept the personal loan offered (1=Yes, 0=No)
Age	customer's age
Experience	number of years of profession experience
Income	annual income of the customer (\$000)
Zip code	home address zip code
Family	family size of customer
CCAvg	average spending on credit cards per month (\$000)
Education	education level (1) undergraduate, (2) graduate, (3) advanced/professional
Mortgage	value of house mortgage (\$000)
Securities	does the customer have a securities account with the bank? (1=Yes, 0=No)
CDAccount	does the customer have a certificate of deposit with the bank? (1=Yes, 0=No)
Online	does the customer use Internet banking facilities (1=Yes, 0=No)
CreditCard	does the customer use a credit card issued by Universal Bank? (1=Yes, 0=No)