Figure 1: The underlying model for the scorecard has an AUC of 0.82, and Accuracy of 76%. A cutoff score of >519 was chosen to maximize profit. Using this scorecard and cutoff for granting credit is expected to generate a profit of $833 per customer and an acceptance rate of ~75% with a default rate of 1.64%.

Score Card Model

Variable	Value	Points
Age	(0, 22]	21
Age	(22, 27]	56
Age	(27, 35]	93
Age	(35, 45]	109
Age	(45, inf]	149
Time at Address	(0, 21]	77
Time at Address	(21, inf]	91
Time at Job	(0, 18]	63
Time at Job	(18, 84]	86
Time at Job	(84, 158]	110
Time at Job	(158, inf]	129
Income to Cash Ratio	[0, 0]	95
Income to Cash Ratio	(0, 0.66]	90
Income to Cash Ratio	(0.66, inf]	84
Credit Card	Other	59
Credit Card	None	71
Credit Card	Visa	113
Credit Card	Cheque Card	136
Credit Card	Mastercard / Euroc	153
Adults in Household	One	66
Adults in Household	Two	104

Figure 1

Figure 2: The score cutoff for granting a loan was chosen based on the scores on the test set. The test set was adjusted using the weights of each observation so that it would be more representative of the population of all loan applicants. The possible profit for every score cutoff from 400 – 600 was calculated and the optimum cutoff that maximized profit was found to be 519. Using this cutoff, the expected profit per customer is $833. The graph shows that as the cutoff score increases the profit increase up until a score of 519. After that point the cost of customers that default start to outweigh the revenue from customers that don't default.
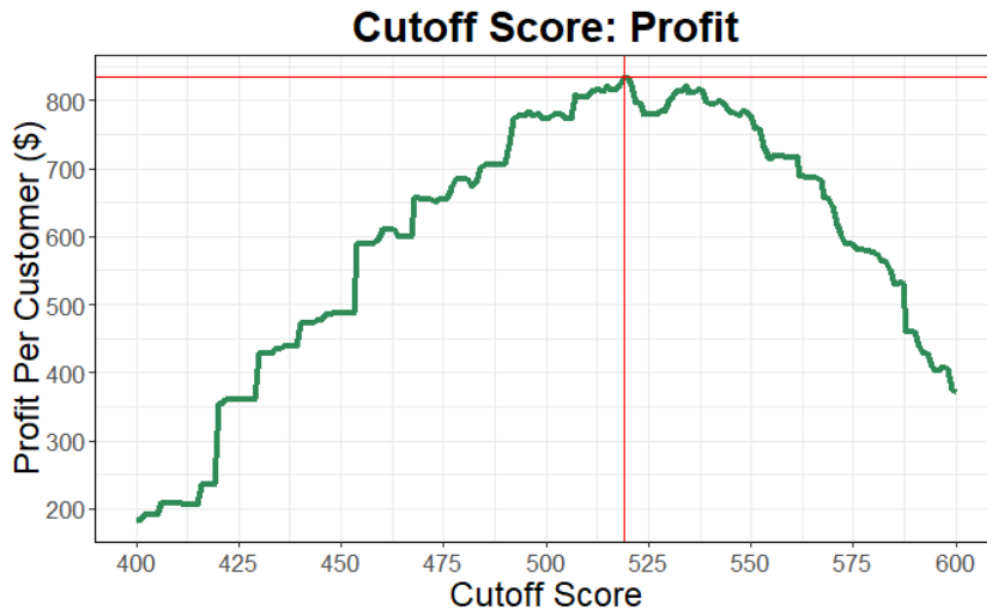
Figure 2

Figure 3: The cutoff score of >519 for granting credit is expected to result in an acceptance rate of ~75% and a default rate of 1.64% based on the adjusted test set. The plot shows that as the cutoff score decreases the acceptance % increases and the default % increases.
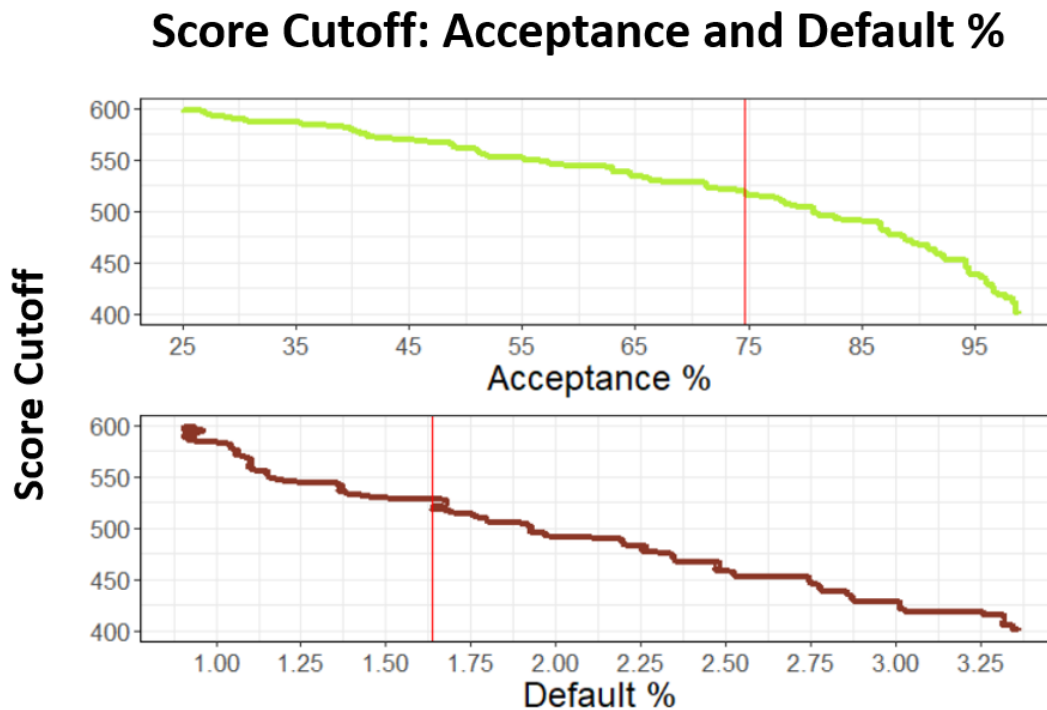

Figure 3

Figure 4: Scores for all samples were binned in intervals of 50. The predicted probability of default was averaged within each bin. The default rate was calculated by taking the number of people that defaulted within each bin divided by number of people in the bin. This shows that as the score increases the average predicted probability and the default rate decreases.
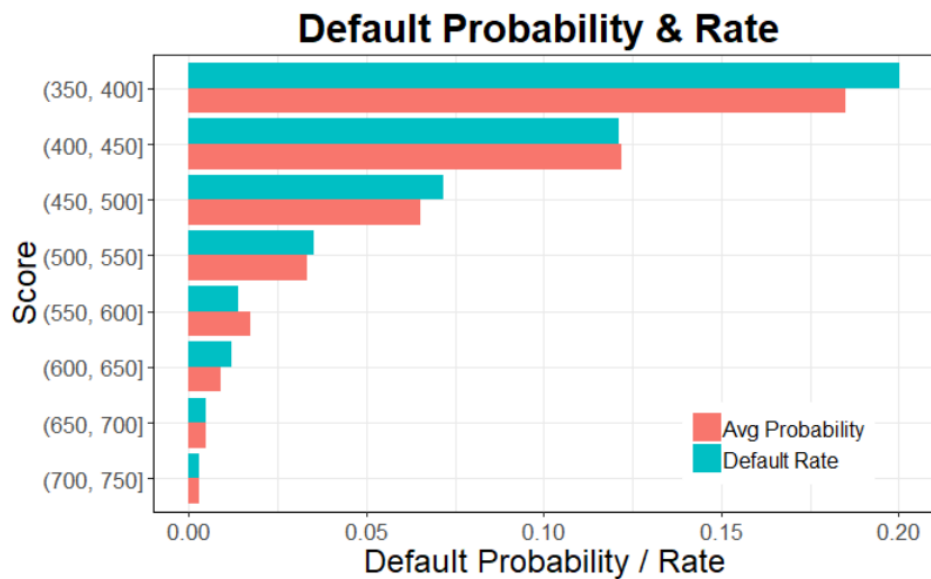

Figure 4

Figure 5: confusion matrix for the adjusted test set and using the cutoff score of > 519 for granting credit. The test set as adjusted using the weights of each observation to create a sample that is more representative of the population of credit applicants. Using the scorecard model and a cutoff of > 519 for predicting whether a customer would default is expected to have an accuracy of 76%
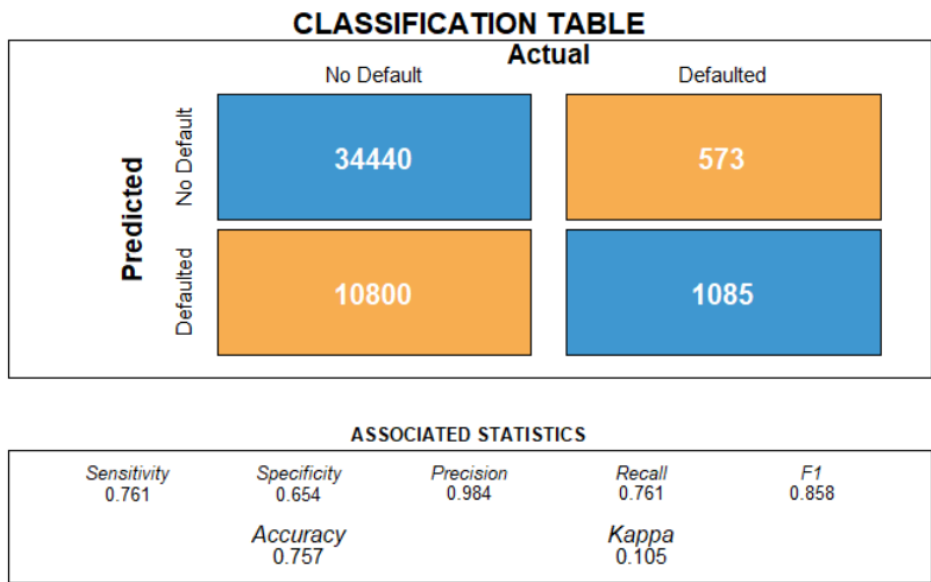

Figure 5