

Fixed Income Analysis

Exercise Sheet 10

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Please hand in your solution on Wednesday 04.12.2019 at the beginning of the lecture.

Exercise 1: We consider the problem of predicting the default probability of a borrower using the logistic regression approach. Download the csv file credit.csv from Moodle.

- a) Using the default indicator as the dependant variable and balance and income as regressors, estimate the logistic regression parameters. Note that since the student variable is Boolean, you should have two regression equations, one when the student variable is 0 and one when the student variable is 1. Provide std.error, Z-statistic and p-value for each coefficient. Which are the regression coefficients that are statistically significant? The threshold is fixed at 0.5.
- b) Using the estimated regression, provide the default probability for a student with a balance of 500 and income of 100.
- c) Construct the corresponding two confusion matrices.

5 points

Exercise 2: A bank uses a simple internal rating system in which there are only three ratings - A, B and C - as well as a default state D. You are given the information about one-year transition probabilities in the following table. There are a few missing entries in the table.

- a) Complete the missing transition and default probabilities

	A	B	C	D
A	0.95	?	0	0
B	0.05	?	0.1	0.05
C	0	0.2	0.5	?
D	?	?	?	?

- b) Assuming the stationary Markov property, compute and plot the default probabilities for each rating class over the time horizons $T = 1, \dots, 20$.
- c) Use the credit rating of 500 firms over 20 years from the csv file CR.csv in Moodle to estimate the transition probabilities.

5 points