

# ESTIMATION OF A CREDIT SCORING MODEL FOR LENDERS COMPANY

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Proposal Presentation Research Practice III

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# The Company

- ▶ Equity Firm
- ▶ Different Branches
- ▶ Mortgage Loans
- ▶ Midtown  $\neq$  Linkvest
- ▶ Loans Money
- ▶ High interest



## Brief Explanation

1. People ask for a loan.
2. Linkvest analyze the background.
3. Make decisions based on experience.
4. Lend money.
5. **Faith.**

# Justification

- ▶ Influent variables.
- ▶ Banks have their own models.
- ▶ Probability of default.
- ▶ Positive cash flows.

## Three Big Problems

- ▶ Linkvest uses a loan application, but ...
- ▶ Decisions based on previous situations.
- ▶ How to know if the person is going to pay?

## General Objective

- ▶ Estimate a Credit Score Model to improve lending decisions on a person using historic data.

## Specific Objective

- ▶ Analyze the best model to improve in our case based in the data.
- ▶ Identify the most influential variables for the company when lending money.
- ▶ Specify the model in mathematical terms.
- ▶ Estimate the probabilities of default.
- ▶ Analyze the results for decision making.

## Schedule

<b>Week</b>	<b>Task</b>
<b>4-5</b>	Proposal Report
<b>6-7</b>	Specification of the model
<b>8-9</b>	Estimation of the model
<b>10</b>	Progress Presentation
<b>11-14</b>	More Estimations
<b>15-16</b>	Final Report
<b>17</b>	Extra Improvements
<b>18</b>	Final Presentation



## Minimum Scope

The main goal is to estimate a credit score model to estimate the probability of default on personal loans using macroeconomic and personal data.

It is important to evaluate the model with real data and take into account the basic assumptions of the model chosen.

## Literature Review

- ▶ Credit Scoring (Cantón, Rubio, y Blasco, 2010) (Hand y Henley, 1997)
- ▶ Discriminant Analysis (Altman, 1968).
- ▶ Linear Probability Models (Orgler, 1970).
- ▶ Logit Models (Wiginton, 1980).
- ▶ Neural Networks (Rosenberg y Gleit, 1994).

## Methodology

The logistic regression model can be formulated as:

$$Z = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \cdots + \beta_k X_k + \mu$$

where  $\mu$  is the disturbance and  $p$  is the probability of default and can be estimated as follows:

$$p = \frac{e^z}{1 + e^z} = \frac{1}{1 + e^{-z}}$$

Then, our response is going to be

$$\text{Default} = \log \left( \frac{p}{1 - p} \right)$$

# Resources

- Altman, E. I. (1968, September). Financial Ratios, Discriminant Analysis and the Prediction of Corporate Bankruptcy. *The Journal of Finance*, XXIII(4), 589-609.
- Cantón, S. R., Rubio, J. L., y Blasco, D. C. (2010, June). A Credit Scoring Model for Institutions of Microfinance under the Basel II Normative. *Journal of Economics, Finance and Administrative Science*, 15(28).
- Hand, D. J., y Henley, W. E. (1997). Statistical Classification Methods in Customer Credit Scoring: A review. *Journal of the Royal Statistical Association*, 160(Part 3), 523-541.
- Orgler, Y. E. (1970, November). A Credit Scoring Model for Commercial Loans. *Journal of Money, Credit and Banking*, 2(4), 435-445.
- Rosenberg, E., y Gleit, A. (1994, August). Quantitative Methods in Credit Management: A Survey. *Journal of Operations Research*, 42(4), 589-613.
- Wiginton, J. C. (1980, September). A Note on the Comparison of Logit and Discriminant Models of Consumer Credit Behavior. *Journal of Financial and Quantitative Analysis*, 15(3), 757-770.

# Thanks For Attending!