Lion's Den

Credit risk modelling exercise

ING

February 2023

do your thing

Credit risk rating model

Description of the tasks

Task 1 – build a model to predict defaults

Imagine that you manage a credit portfolio in the Big Lion Bank. The bank is currently planning to grant loans to small and medium enterprises. Knowing that your bank's core activities concern lending to different types of clients, it is clear that a well-performing portfolio of credit exposures to companies is a critical factor to the bank's sustainable growth and profitability. In this context, your greatest concern is to limit potential losses on loans to companies. To this end, a proper tool to quantify default risk of bank's obligors will be a key success factor.

In this task, your aim is to build a model that will allow you to precisely quantify probability of default of bank's clients, namely small and medium enterprises, and to present modelling and prediction results.

Luckily, we have collected data for you and now all you need is to come up with a sound credit risk model allowing the Big Lion Bank to expand its business. The collected annual data on borrowing companies are provided as a series of rows in the CSV file ("credit_data.csv") and include:
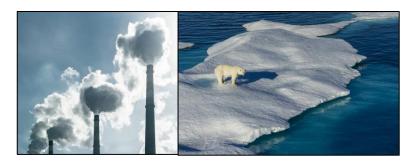
1.customer IDs (ID),
2.reporting date (end_date),
3.financial information, such as balance sheet items in the local currency (lions) and financial ratios,
4.The binary target variable taking the value of 1 when a performing company is going to enter the state of default (e.g., the company will not be able to repay its obligations) during the next 12 months, and 0 otherwise. We assume that defaulted companies cannot be cured and they stay in default forever.
All variables are explained in the dictionary file ("description of variables.xlsx").

Task 1 – general tips/guidance to the modelling competition

- You should evaluate general performance of the model and its ability to accurately predict defaults of Bank's customers;

- Ensure economic interpretability of the model and its components;

- Analyze quality of data used for the analysis;

- Putting visualizations/graphs would be a good way to show your ability to understand the topic and clearly present the results;

- High degree of creativity in the approach to problem solving is appreciated;
- Ensure readability of codes;

What is ESG?

Environment

Environmental Risk
- Harmful effects a company may have on environment
- Reputational Risk
- Pollution Prevention & Control
- Transition to an environmentally sustainable economy

Climate Risk
- Risks of climate change
- Physical Risk from Extreme weather events
- Long-term climate change mitigation.

Social

Impact on Society, the community, the workforce and stakeholders in general.

- Labour strikes or consumer protests
- Exposure to geopolitical conflicts
- Protection of local and indigenous communities
- Investment in human capital

Governance

Role of efficient governance in institutions to avoid any unwarranted impacts on the shareholders, customers, employees, and all stakeholders.

- Role and makeup of board of directors
- Distribution of rights & responsibilities among different participants in a firm
- Promotion of good practices
- Fighting against corruption and fraud

Task 2 – concept of ESG risk

ESG Questions:

1. In today's conscious environment, where consumers and regulators alike emphasize on businesses to be more sustainable in their operations – what in your opinion are the immediate risks that our clients face?

2. What are your views on usefulness of incorporating ESG concerns into credit risk modelling?

   a) Can you think of some potentially useful ESG risk drivers?
   b) Which of the risk drivers used by you in the model could be impacted by ESG risks in the future? Could you describe the effects qualitatively?
   c) What additional data would you like to see included for ESG in your modelling?

Submission requirements

For the **first task**, we expect from you:

1. Report that highlights prediction results, assessing quality of the model (a docx, pdf or notebook file, max. 4 pages);
2. Codes used for modelling.

For the **second task**, we expect from you:

1. An essay (max 4 pages), discussing the questions.

do your thing