From A to Loan: Leveraging Pre-Evaluation Data to Predict ESG Loan Approval and Guide SME Success

Introduction and Motivation

The urgency to prioritize Environmental, Social, and Governance (ESG) practices has risen across companies in recent years. Small and Medium-sized Enterprises (SMEs) face pressure from various groups like customers, investors, employees, and regulators to integrate sustainable values into their operations. Achieving this involves strategic adjustments and reporting obligations influenced by regulations, access to capital, and financial health. According to a 2022 McKinsey & Company report, 90% of SP 500 companies and 70% of Russell 1000 companies disclose ESG reports, and this trend is expected to continue [**?**].

Challenges and Solutions

Embracing ESG can give SMEs a competitive edge. It can help them attract and retain skilled workers, decrease employee churn, and even obtain investment funds. Additionally, with the demand for ESG-conscious products and services, it also positions SMEs for better growth. However, such reporting is resource-intensive and often discourages SMEs from engaging in it.

A proposed solution to overcome this challenge is a Streamlined Pre-evaluation Framework. This framework provides SMEs with a way to self-evaluate and measure their position on the ESG scale. This process aims to offer SMEs a preliminary assessment of their potential ESG score and position through the following:

- **Fundamental Questionnaires**: SMEs will be guided through a set of fundamental questions covering environmental practices, social responsibility, and governance structures.
- **A-D Rating System**: SME responses will be rated on a simple A-D scale (A=highest, D=lowest) based on predefined criteria, allowing for an intuitive understanding of their performance regarding ESG aspects.
- **Decision Model**: A decision-based model will be built from historical data of SMEs to predict the likelihood of obtaining a loan or not (ESG Loan Approval).

Description of the Data and Task

For the scope of this assignment, you will handle the third part of the process. You will be given a dataset that is obtained after assessing some companies and rating them according to their answers. The dataset includes the following columns:

- **Company**: Company ID (Numerical)
- **EGroup1, EGroup2, EGroup3, EGroup4**: Environmental question groups (Categorical)
- **GGroup1**: Governance question group (Numerical)
- **SGroup1, SGroup2, SGroup3, SGroup4**: Social question groups (Categorical)
- **Controversy Level**: The level of controversies associated with the company's ESG practices (Categorical)

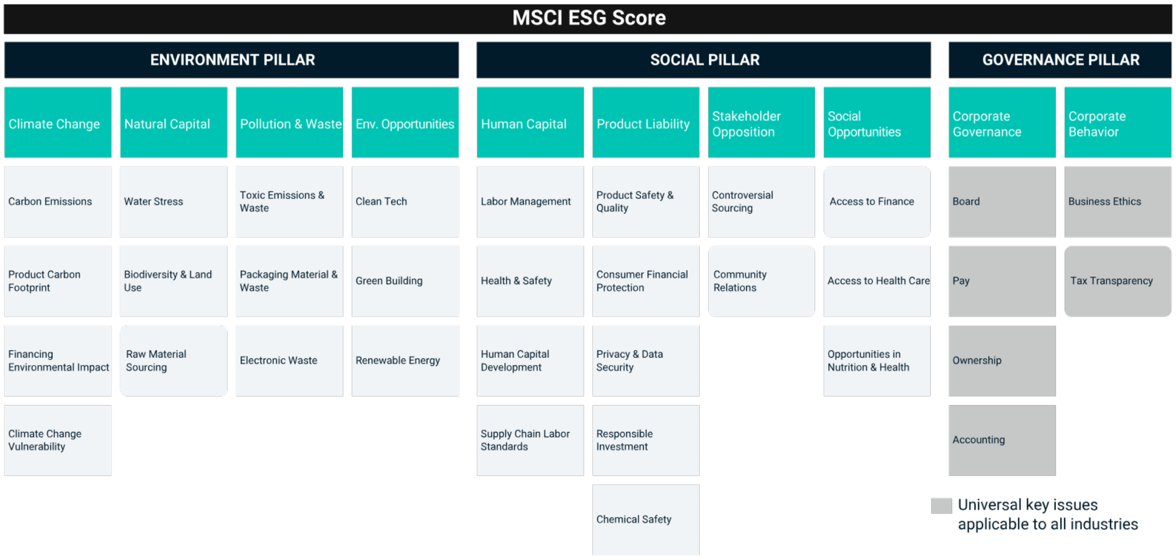

Figure 1: ESG Ratings Key Issue Framework, MSCI. Source: MSCI

- **Controversy Score**: A representation of the extent of ESG-related controversies (Numerical)
- **ESG Loan Approval**: The target variable that represents the likelihood of loan approval (Categorical)

Assignment Objective

Your objective is to generate a model to predict the ’ESG Loan Approval’ and explain why a company is predicted to have a high, medium, or low likelihood of approval. Additionally, suggest ideas to improve their status.

Your study might contain the following parts:

- **EDA & Statistical Analysis**: Analyze the distribution of variables and their impact on loan approval.
- **Approach to Tackle the Challenge**: Formulate a master plan to address the multi-task challenge.
- **Model Choice**: Select an appropriate model for each step, keeping in mind to avoid time/resource-consuming models.

Background Reading

1. ESG scoring for SMEs: Investopedia ESG Criteria
2. Flögel, F., Schepelmann, P., Zademach, H.-M., & Zörner, M. (2023). Injecting climate finance into SME lending in Germany: Opportunities for and limitations of regional savings and cooperative banks. ZFW – Advances in Economic Geography. https://doi.org/10.1515/zfw-2022-0011
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7. Eurochambres and SME United. Sme experiences with finance and sustainable investment survey, 2023.

8. L. Perez, V. Hunt, H. Samandari, R. Nuttall, and K. Biniek. Does esg really matter—and why? McKinsey Company, 2022.