PREDICTING SOLVENCY RISK OF PUBLIC LISTED COMPANIES OF SRI LANKA IN TOURISM INDUSTRY WITH REFERENCE TO THE IMPACT OF CORONAVIRUS PANDEMIC USING MACHINE LEARNING

L. M. Livera

A dissertation submitted in partial fulfilment of the requirement for

Master of Science degree in Business Analytics

Department of Computing

Informatics Institute of Technology, Sri Lanka

in collaboration with

Robert Gordon University, UK

2022

Abstract

Objectives of the Study

The aim of the study was to examine how coronavirus pandemic has impacted the solvency risk faced by the publicly listed companies in the Colombo Stock Exchange who are operating in the tourism industry. The main research objectives were to identify the determinants that has mostly affected the solvency risk faced by companies during the distress time, predict whether the company would be defaulting or not and predict the solvency risk faced by the public listed companies by building machine learning models.

Methodology

The main methodology pursued was two-fold as classification and regression where classification models were used to predict the default state and regression models were used to predict the solvency risk as a continuous variable. In building these models, financial data published in the Colombo Stock Exchange and macro-economic information published in Central Bank of Sri Lanka for 10-year period were used. A sample of 7 tourism based listed companies were selected randomly from the total sample frame. After preprocessing and partitioning of data, the machine learning models were fitted with different algorithms for all sample companies. The variables that best describe the variance of the models were selected using Principal Component Analysis. After the models are trained, using test data the models were evaluated.

Results and Findings

Using Root Mean Square Error, Mean Square Error, and Mean Absolute Error metrics the regression models were evaluated whereas Confusion Matrix and Accuracy metrics were used to evaluate the classification models. The Principal Component Analysis identified which variables best describe the solvency risk and helped to remove the redundant variables thus dimensionality of the variables was reduced best fitting the models with high accuracy. From this analysis it was found that both financial and macro predictors are

important in predicting the response variable. From the model evaluation it was found that Naïve Bayes Classification and Bagging Regression best predict the default status and solvency risk faced by the public listed companies during the period of coronavirus pandemic.

Key words : Machine Learning, Prediction, Solvency Risk, Defaulting, Coronavirus, Naïve Bayes, Bagging