Final Year Project Showcase Batch-2018
Year 2022

Department: Mathematics		
Programme: Computational Finance		
1	**Project Idea**	Forecasting bankruptcy has attained great relevance for firms due to the growing number of corporate failures, especially since the Global Financial Crisis (GFC) of 2007-2008. The COVID-19 pandemic further put stress on the existing bankruptcy models and their ability to predict corporate bankruptcies in such extraordinary times. Creditors and investors now take a keen interest in knowing the financial bankruptcy risk of a firm before making any investment or credit-granting decisions to avoid a substantial loss. Despite a growing number of bankruptcy prediction models, practitioners have little or no consensus as the significance of models varies across regions. Therefore, we intend to work on **Assessment of Corporate Bankruptcies: An Evidence from Pakistan**
2	**Process**	This study identifies the determinants of bankruptcies using three sets of variables including financial ratios, macroeconomic indicators, and equity market variables. It further tests the impact of COVID-19 and its significance across non-financial industries in the context of Pakistan. The panel of 277 firms over the period 2005 to 2020 used the panel logit regression technique to model the relationship. The data is initially winsorized, and the variables are shortlisted based on the Variance Inflating Factor. After that, the panel unit root test is next executed, followed by model diagnostic tests. Model selection criterion initiates by applying the Hausman test which directs which panel model either the fixed or random effect model should be used. Since beta coefficients from the logit model are odd ratios, thus marginal effects are computed. The post-diagnostic tests are then applied to detect the presence of heteroscedasticity and autocorrelation. A robustness test is used to improve the standard errors. Lastly, the study checked the ROC to determine the accuracy of the estimated model.
3	**Outcome**	The results demonstrated that among financial ratios, the key estimators for the detection of distress risk are Quick Ratio, Debt to Equity Ratio, Gross Profit Margin, Inventory Turnover, and Current Liabilities to Total Assets. Moreover, it is discovered that the size of the firm and stock return is important among the market variables while Balance of Trade, Debt to GDP Ratio & Unemployment are considered strong predictors of bankruptcy. Examining COVID-19's repercussions, was one of the study's objectives, the current research found that COVID-19 may be the cause of the economic slump in Pakistan, although it is not statistically proven in the current study. The model attained 93.98% of predictive accuracy.
4	**Evidence (Theoretical Basis)**	Business failure is usually an extremely costly and disruptive event that has become a significant global issue after the 2008 global financial crisis and then the COVID-19 pandemic. Major stock market indexes collapsed at an extraordinary pace, reflecting

		catastrophe losses in the corporate sector. Detecting early signs that a company is going to enter bankruptcy involuntarily and being able to save it from that process, can help reduce the economic losses that bankruptcy entails, both in quantitative and qualitative terms. Empirical studies have shown that investment opportunities are significantly associated with the likelihood of bankruptcy. Therefore, expansion in conducting studies about bankruptcy and its devastating effects on the economies of various countries has a huge significance. Hence, the relevant and significant factors of bankruptcy are modelled in the study using the panel logit model. The results of this study will assist company managers in identifying early warning indications of financial problems and taking effective measures.
5	**Competitive Advantage or Unique Selling Proposition**	
a	**Attainment of any SDG** (e.g. How it is achieved and why it is necessary for the region)	**SDG#8: Decent Work & Economic Growth** Reduction in bankruptcy rates will improve the performance of industries leading to a sustainable society and ultimately improving the economic growth
b	**Cost Reduction of Existing Product**	By predicting bankruptcy in the early stages, the company and stakeholders can take precautionary measures. This would help firms to save themselves from a significant loss in case of default and help continue economic activities.
c	**Process Improvement which Leads to Superior Product or Cost Reduction, Efficiency Improvement of the Whole Process** (e.g. What is the issue is the current process and what improvement you suggest)	The bankruptcy prediction model has no consensus all around the world as every country and its industries have their unique dynamics and characteristics. Thus in this regard, we incorporated the unique dynamics of the non-financial industries of Pakistan. Our research contributes to the improvement of the distress prediction model by integrating EBITDA and shareholder's equity being negative for consecutive two years as the definition of bankruptcy for the endogenous variable. Further, the research incorporates the financial vulnerabilities associated with the COVID-19 Pandemic. The present work can be extended by employing the post-COVID period as the study considered the COVID period of 2019-2020 from the span of 15 years. Further, the use of machine learning tools will enhance the predictive ability of the bankruptcy forecasting model.
d	**Expanding of Market share** (e.g. how it expands and what is the problem with the current market	Better insights on creditworthiness would enhance the business confidence and help attract investments which would induce market expansion.
e	**Capture New Market** (e.g. Niche market or unaddressed segment)	Early warning indications of bankruptcy may lead to the demand for default risk hedging instruments in the financial markets. This increase in demand for hedging instruments would help the financial institutions launch more tailored, more customized and sophisticated hedging instruments covering unique characteristics of companies which would lead to the development of a new market and hence our project can play a role in capturing a new market.
6	**Target Market** (Industries, Groups, Individuals, Families, Students, etc) Please provide some detail about the end-user of the product, process, or service	The beneficiary of the model would be the credit rating agencies who can rate the firm according to the probability of default calculated. It can also be useful for the Government sector for policy control purposes and for the company to evaluate its existing performance.

7	**Team Members** (Names along with email address)	Aiman Fatima Rizvi (aimanfatima1835@gmail.com) Syeda Areeza Batool Rizvi (areezabatool5@gmail.com) Muhammad Muaaz (muhammed.muaaz@gmail.com) Maham Naeem (mahamnaeem2000@gmail.com)
8	**Supervisor Name** (along with email address)	Dr Usama Ehsan Khan – Senior Economist at FPCCI usama.khan@fpcci.org.pk Sami Ullah Qureshi – Lecturer, Department of Mathematics, samiaerc@neduet.edu.pk