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Comparing Middle East Banking Efficiency DEA with DEA-Decision Tree Machine Learning Model Taking the Lebanese Banks Sector as Pilot Study Forecasting the Banking Financial Efficiency Crisis

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Abstract

Execution assessment of banks is important for the middle east society and population. Legal instincts go for securing the general population so as to tackle individuals' issues and problems. In this manner, it is important to deal with bank cases in an effective way. In this paper, to conduct our analysis, we implemented and compared seven Machine Learning Models: Neural Network, Logistic Regressions, Discriminant Analysis, Bayesian Network, Decision Tree C5.1, Decision Tree CHAID1, and Decision Tree C&R1. This paper embraces the higher accuracy ML model, comparing DEA efficiency with DEA-Decision Tree forecasting efficiency in a pilot study without thinking about the loads of the output and the inputs forecasting to assess productivity of instances of 136 Banks in middle east which trained our Machine Learning Models, then implementing the trained model on 33 Banks in the Lebanese banking sector. At that point, Machine Learning AI Decision tree as Data Mining techniques are utilized to gain proficiency with the aftereffect of DEA, which can be utilized to predict and discover significant components of influencing the bank effectiveness. Our contribution in the Machine Learning models comparison, and DEA-DT model implementation on the pilot study the Lebanese Banking sector was fruitfully giving a forecasting efficiency for the banks in the Lebanese sector compared to DEA efficiency we conducted, providing better efficiency results predicting and forecasting the Lebanese banking sector potential in both the better and worse scenarios.

Keywords: DEA, Neural Network, Logistic Regressions, Discriminant Analysis, Bayesian Network, Decision Tree, Lebanese banking sector, Middle East