A Fuzzy Logic based Model for Predicting Commercial Banks Financial Failure

Ahmed Sayed Abd El Hamid Salama ,Ahmed A. Mohamed

Abstract

The financial failure of most commercial banks is hardly identified and detected. Machine learning techniques as Fuzzy logic (FL), Artificial Neural network (ANN), Case based reasoning (CBR) and Rule based system (RBS) are important techniques that are used in prediction and forecasting generally. This paper introduces a fuzzy logic based proposed model which can help the decision maker in commercial banks to make the right decision to determine level of financial failure in the bank. The proposed model employing financial ratios rules used in Egyptian commercial banks to measure the bank financial performance indicators i.e. capital adequacy, asset quality, liquidity, and earnings in order to determine their financial failure. The proposed model uses fuzzy logic in MATLAB to build financial ratios membership functions. In addition, the implementation of the proposed model used visual studio 2010 to build the graphical user interface for the user. The implemented system was tested on two of the Egyptian commercial banks i.e. CIB bank and CFEB bank. The mathematical equation of the defuzzification was applied to calculate financial failure in these two banks. After implementing and applying the proposed model, it was proved that the fuzzy logic technique is one of the most important machine learning techniques that can be used to detect financial failure in commercial banks and the proposed model proved that it is highly effective, scalable, and reliable in detecting the financial bank failure.