

Detecting Fraudulent Financial Reporting and Predicting Business Failure Using Probabilistic Neural Network: Malaysia Chapter

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Methodologies with the integration of machine learning (ML) into fraudulent financial reporting (FFR) and business failure detection have been researched popularly globally however these ML methodologies were not popular researched in Malaysia Specifically. Studies showed that Probabilistic Neural Network (PNN) yielded highest fraudulent detection rate about 98%; and Neural Network achieved overall accuracy of 84% of business failure detection rate. It was also found that there was no specific method mentioned in Malaysia Securities Commission Act 1993 in assessing the financial statements of public listed companies (PLCs), and low expenditure of PLCs in audit functions. Due to the huge impacts resulted from FFR and business failure of public listed companies, there is a need to minimise FFR and business failure incidents with high accuracy detection and prediction tools, which are ML techniques. The applications of ML technique (i.e., PNN) into the research would shorten the analysis time compared to other statistical methods; yield higher accuracy rate that becomes effective layer of screening financial statements; is able to optimise or minimise the loss functions if discrepancies occur in data sets. On the other hand, although the relationship between FFR and business failure has been linked, the two topics have been studied separately in the past. Financially distressed companies may have a higher probability to commit fraudulent financial reporting, and less research that link the two topics although the methodologies and models were found effective in research the two topics. This study aims to firstly determine the accuracy of ML technique, i.e. PNN in the detection of FFR and detection of business failures among the public listed companies in Malaysia. The relationship between business failure and FFR among the PLCs in Malaysia would be identified. This study applies two stage PNN procedures: first stage is to detect FFR among the companies; second stage is to predict business failure of the companies prior to the conduct of FFR. The accuracy of PNN in the applications and the relationship between FFR and business failure will be discovered. Secondary data is to be collected through financial reports from the PLCs that have been identified fraudulent by the Securities Commission Malaysia in the past. A set of identical non-fraudulent and non-failed companies (similar size in same industries) would be as pairs to the fraudulent companies in the study. PNN is expected to yield high

accuracy rates in detecting fraudulent companies and predicting business failures. The ML methodology would also be expected to detect the relationship between FFR and business failure (as supported by fraud triangle theory that financial distress is one of the elements in committing frauds). The research should enhance the detectability of frauds and business failures among the PLCs, improves overall corporate governance of the companies and increase public confidences onto PLCs; furthermore, this would also enhance the knowledge of forensic accounting in Malaysia.

Keywords: *Business Failure, Fraud Triangle Theory, Fraudulent Financial Reporting, Machine Learning, Probabilistic Neural Network*