Enhancing Early Warning Systems for Financial Misstatements

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Abstract : Following the Wells Fargo scandal involving the creation of millions of unauthorized accounts and subsequent fines, the spotlight has turned to improving internal controls. This study introduces a novel data mining method designed to enhance the prediction of financial misstatements and fraud. A central feature of this method is its capacity to reveal the intricate conditional interdependencies among various financial indicators through a Bayesian-belief-based probabilistic network. The Tree Augmented Bayesian Belief Network (TAN), optimized via a Genetic Algorithm and Random Forests, achieves notable predictive precision (AUC of 0.816) with a reduced set of variables. This refined approach not only predicts potential financial misstatements but also equips stakeholders with a nuanced MWIC risk score, improving early warning systems against financial discrepancies and fraud, with a particular focus on the nuanced interplay of predictive variables.

Keywords : Bayesian belief networks, genetic algorithms, machine learning, financial misstatements, fraud detection
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