

Business Distress Prediction in Albania with Artificial Intelligence

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Introduction

Business distress prediction is a crucial aspect of financial risk management, particularly in economies like Albania, where businesses face unique economic and regulatory challenges. Predicting business distress accurately helps stakeholders, including investors, policymakers, and financial institutions, take proactive measures to mitigate risks and enhance economic stability. Various classification methods have been developed to improve the accuracy of distress prediction, leveraging both traditional financial indicators and advanced machine learning techniques. The prediction of business distress relies on analyzing financial statements, market conditions, and macroeconomic indicators. Traditional classification methods, such as logistic regression and discriminant analysis, have been widely used to distinguish between financially stable firms and those at risk of distress. These models consider key financial ratios, such as profitability, liquidity, leverage, and efficiency, to assess the financial health of a business. However, while these methods provide valuable insights, they often struggle with nonlinear relationships and complex interactions among financial variables.

Description

Machine learning approaches have gained prominence in recent years due to their ability to handle large datasets and capture complex patterns in financial data. Decision trees, support vector machines, neural networks, and ensemble learning techniques, such as random forests and gradient boosting, have shown significant improvements in prediction accuracy. These models utilize historical data to identify distress patterns and generate predictive insights that traditional methods may overlook. Feature selection and data preprocessing play a critical role in enhancing the performance of these models, ensuring that the most relevant variables contribute to the prediction process. In the context of Albania, the application of these classification methods requires careful consideration of the local business environment. The Albanian economy is characterized by a high number of Small and Medium-Sized Enterprises (SMEs), which often face financial constraints and regulatory hurdles. Economic fluctuations, limited access to financing, and political uncertainties further contribute to business distress. As a result, predictive models must incorporate local economic indicators and sector-specific risk factors to improve their effectiveness [1].

A comparative analysis of different classification methods can provide valuable insights into their strengths and limitations in predicting business distress in Albania. Logistic regression remains a widely used baseline model due to its interpretability and ease of implementation. However, decision tree-based models, such as random forests and gradient boosting, often outperform traditional statistical methods by capturing nonlinear relationships and complex interactions among financial variables. Neural networks, despite their high computational requirements, offer promising results in detecting intricate patterns in financial distress data. The integration of alternative data

sources, such as sentiment analysis from news articles, social media trends, and credit scoring data, can further enhance business distress prediction. By leveraging big data analytics, predictive models can incorporate real-time information, improving their responsiveness to economic changes. Additionally, the adoption of explainable Artificial Intelligence (XAI) techniques ensures that machine learning models remain transparent and interpretable, allowing decision-makers to understand the underlying factors influencing distress predictions [2,3].

To improve the reliability and applicability of classification models, it is essential to address data quality issues and imbalanced datasets. Business distress cases are often less frequent than financially stable firms, leading to class imbalance in predictive modeling. Techniques such as oversampling, undersampling, and synthetic data generation help mitigate this challenge, ensuring that the models effectively capture distress patterns without biasing predictions toward non-distressed firms. Policy implications of business distress prediction in Albania include the development of early warning systems for financial institutions, regulatory bodies, and business owners. By identifying at-risk firms in advance, financial institutions can implement targeted interventions, such as restructuring loans or providing financial advisory services, to prevent bankruptcies. Policymakers can use predictive insights to design economic policies that support business resilience, while investors can make informed decisions based on risk assessments generated by classification models [4,5].

Conclusion

Future research in this area should focus on refining classification techniques, incorporating alternative data sources, and adapting predictive models to the evolving Albanian business landscape. The continuous advancement of artificial intelligence and machine learning offers new opportunities for enhancing business distress prediction, ultimately contributing to a more stable and resilient economy in Albania. The prediction of business distress relies on analyzing financial statements, market conditions, and macroeconomic indicators. Traditional classification methods, such as logistic regression and discriminant analysis, have been widely used to distinguish between financially stable firms and those at risk of distress. These models consider key financial ratios, such as profitability, liquidity, leverage, and efficiency, to assess the financial health of a business.

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Conflict of Interest

None.

References

1. Abdou, Hussein A., Marc D. Dongmo Tsafack, Collins G. Ntim and Rose D. Baker. "Predicting creditworthiness in retail banking with limited scoring data." *Knowledge-Based Syst* 103 (2016): 89-103.
2. Addo, Peter Martey, Dominique Guegan and Bertrand Hassani. "Credit risk analysis using machine and deep learning models." *Risk* 6 (2018): 38.
3. Akkoç, Soner. "An empirical comparison of conventional techniques, neural networks and the three stage hybrid Adaptive Neuro Fuzzy Inference System

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- (ANFIS) model for credit scoring analysis: The case of Turkish credit card data." *Eur J Oper Res* 222 (2012): 168-178.
4. Alam, Nurul, Junbin Gao and Stewart Jones. "Corporate failure prediction: An evaluation of deep learning vs discrete hazard models." *J Int Financ Markets Inst. Money* 75 (2021): 101455.
 5. Ashraf, Sumaira, Elisabete GS Félix and Zélia Serrasqueiro. "Do traditional financial distress prediction models predict the early warning signs of financial distress?." *J Risk Financ Manag* 12 (2019): 55.

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