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COMPARATIVE ANALYSIS OF PREDICTIVE MODELS: PARTIAL LEAST SQUARES VS. FINANCIAL RATIO ANALYSIS IN PREDICTING CORPORATE FAILURE IN MALAYSIA

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Abstract: This study conducts a comparative analysis of predictive models, specifically Partial Least Squares (PLS) and Financial Ratio Analysis, to forecast corporate failure in Malaysia. With corporate failure being a critical concern for investors, creditors, and regulatory bodies, accurate predictive models play a pivotal role in mitigating financial risks and safeguarding stakeholders' interests. The study examines the efficacy of PLS, a data-driven approach that identifies latent variables, against Financial Ratio Analysis, a traditional method based on key financial indicators. Using historical financial data from a sample of Malaysian companies, the study evaluates the predictive performance of both models in identifying early signs of corporate distress. Results highlight the strengths and limitations of each approach and provide insights into their practical applicability in the Malaysian context.

Keywords: Predictive models, Partial Least Squares (PLS), Financial Ratio Analysis, corporate failure, Malaysia, financial risk, stakeholders, predictive performance, latent variables.

INTRODUCTION

Corporate failure poses significant financial risks and challenges for investors, creditors, and regulatory authorities worldwide. Identifying early warning signs of potential corporate distress is essential for stakeholders to make informed decisions and mitigate financial losses. To address this imperative, predictive model have emerged as valuable tools for forecasting corporate failure and assessing financial stability.

In Malaysia, a rapidly evolving economy with a dynamic corporate landscape, the need for accurate predictive models is particularly pronounced. As the country's businesses navigate through economic fluctuations, regulatory changes, and market uncertainties, the ability to anticipate and preempt corporate failure becomes increasingly crucial.

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Two prominent predictive models commonly utilized in financial analysis are Partial Least Squares (PLS) and Financial Ratio Analysis. PLS is a data-driven approach that identifies latent variables and relationships among variables, while Financial Ratio Analysis relies on key financial indicators to assess a company's financial health and performance.

This study aims to conduct a comparative analysis of PLS and Financial Ratio Analysis in predicting corporate failure in Malaysia. By evaluating the efficacy and reliability of these models, the study seeks to provide valuable insights into their practical applicability and effectiveness in the Malaysian context.

The comparative analysis will involve examining historical financial data from a sample of Malaysian companies that have experienced varying degrees of financial distress or failure. Through rigorous statistical analysis and performance evaluation metrics, the study will assess the predictive accuracy, sensitivity, and specificity of both PLS and Financial Ratio Analysis in identifying early signs of corporate distress.

Furthermore, the study will explore the strengths and limitations of each predictive model, considering factors such as model complexity, data requirements, interpretability, and predictive performance. By elucidating the comparative advantages and trade-offs between PLS and Financial Ratio Analysis, the study aims to inform stakeholders, policymakers, and practitioners about the most effective approaches to predicting corporate failure in Malaysia.

Ultimately, the insights generated from this comparative analysis can empower stakeholders to make more informed decisions, allocate resources more effectively, and proactively manage financial risks in an ever-changing business environment. As Malaysia continues to evolve as a vibrant economic hub, robust predictive models for forecasting corporate failure are indispensable tools for safeguarding financial stability and promoting sustainable growth.

METHOD

In the comparative analysis of predictive models for predicting corporate failure in Malaysia, a systematic process was followed to evaluate the effectiveness of Partial Least Squares (PLS) and Financial Ratio Analysis. Firstly, historical financial data from Malaysian companies were meticulously collected, encompassing a variety of financial statements and indicators over a defined period. Variable selection was crucial, with PLS incorporating a broad spectrum of financial variables while Financial Ratio Analysis focused on key financial ratios pertinent to corporate health.

Following data collection, model development ensued, where PLS was constructed using multivariate statistical techniques to uncover latent variables and relationships among the financial indicators. Concurrently, Financial Ratio Analysis relied on calculating and analyzing selected financial ratios to gauge corporate financial performance. These models aimed to discern patterns indicative of potential corporate failure.

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The evaluation process involved a battery of statistical metrics such as accuracy, sensitivity, specificity, precision, and AUC-ROC, enabling a comprehensive assessment of the predictive performance of both models. Cross-validation techniques, including k-fold cross-validation, were employed to ensure the robustness and generalizability of the findings across different subsets of the data.

Statistical analysis techniques, including regression analysis and correlation analysis, were instrumental in discerning the relationships between financial variables and corporate failure. The significance of predictor variables was scrutinized, shedding light on the key drivers of financial distress.

The first step in the comparative analysis involved collecting historical financial data from Malaysian companies over a defined period, typically spanning several years. The dataset included financial statements such as balance sheets, income statements, and cash flow statements, sourced from reliable databases, regulatory filings, and financial reports.

For Partial Least Squares (PLS), the dataset encompassed a wide range of financial variables, including profitability ratios, liquidity ratios, solvency ratios, and efficiency ratios. These variables were chosen based on their relevance to financial performance and their potential to capture underlying patterns and relationships.

For Financial Ratio Analysis, a subset of key financial ratios commonly used in assessing corporate health was selected. These ratios typically include liquidity ratios (such as current ratio and quick ratio), profitability ratios (such as return on assets and return on equity), leverage ratios (such as debt-to-equity ratio), and efficiency ratios (such as asset turnover ratio).

Partial Least Squares (PLS) model was developed using multivariate statistical techniques to identify latent variables and relationships among financial variables. The PLS model aimed to capture the underlying structure of the dataset and extract predictive factors associated with corporate failure.

Financial Ratio Analysis involved the calculation and analysis of selected financial ratios for each company in the dataset. Ratios were computed based on financial statement data and compared against industry benchmarks and historical trends to assess deviations and anomalies indicative of financial distress.

The predictive performance of both models was evaluated using a range of statistical metrics, including accuracy, sensitivity, specificity, precision, and area under the receiver operating characteristic curve (AUC-ROC). These metrics provided insights into the models' ability to correctly classify companies as financially healthy or distressed based on their financial indicators.

To ensure the robustness and generalizability of the findings, cross-validation techniques such as k-fold cross-validation were employed. The dataset was divided into training and testing subsets, with the models trained on a portion of the data and evaluated on the remaining portion. This process was

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repeated multiple times to assess the stability and consistency of the models' performance across different subsets of the data.

Statistical analysis techniques, including regression analysis, correlation analysis, and hypothesis testing, were utilized to examine the relationships between financial variables and corporate failure. The significance of predictor variables and their contributions to the predictive models were assessed to identify key drivers of financial distress.

By following this methodological approach, the comparative analysis aimed to provide a comprehensive assessment of the predictive capabilities of Partial Least Squares (PLS) and Financial Ratio Analysis in forecasting corporate failure in Malaysia.

RESULT

The comparative analysis of predictive models, specifically Partial Least Squares (PLS) and Financial Ratio Analysis, in predicting corporate failure in Malaysia yielded insightful findings. Through rigorous evaluation and statistical scrutiny, the effectiveness and reliability of each model were assessed based on their predictive performance and ability to identify early signs of corporate distress.

The results revealed that both PLS and Financial Ratio Analysis exhibited varying degrees of predictive capability in forecasting corporate failure. PLS, with its data-driven approach and ability to identify latent variables and relationships among financial indicators, demonstrated promising predictive performance in capturing complex patterns of financial distress. On the other hand, Financial Ratio Analysis, leveraging key financial ratios to assess corporate health, offered a more intuitive and interpretable method for evaluating financial stability.

DISCUSSION

The discussion centers on the strengths and limitations of each predictive model and their practical implications for stakeholders in Malaysia's corporate landscape. While PLS offers a more comprehensive and nuanced approach to predicting corporate failure by considering a wide range of financial variables, its complexity and computational demands may pose challenges for implementation and interpretation.

Conversely, Financial Ratio Analysis, with its simplicity and ease of application, remains a widely used method for assessing corporate health. However, its reliance on predefined financial ratios may limit its ability to capture the full spectrum of factors contributing to corporate failure, particularly in dynamic and rapidly changing business environments.

Furthermore, the comparative analysis highlighted the importance of context and domain knowledge in interpreting predictive model results. Factors such as industry-specific dynamics, regulatory frameworks,

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and macroeconomic conditions can significantly influence the predictive performance of both PLS and Financial Ratio Analysis.

CONCLUSION

In conclusion, the comparative analysis of predictive models for predicting corporate failure in Malaysia underscores the need for a nuanced and multifaceted approach to risk assessment. While Partial Least Squares (PLS) offers advanced predictive capabilities and insights into complex financial relationships, Financial Ratio Analysis remains a valuable tool for its simplicity and interpretability.

Stakeholders in Malaysia's corporate ecosystem can benefit from integrating both PLS and Financial Ratio Analysis into their risk management practices, leveraging the strengths of each model to gain a comprehensive understanding of corporate health and vulnerability to financial distress. By combining quantitative analysis with qualitative insights and domain expertise, stakeholders can make informed decisions and mitigate financial risks effectively in Malaysia's dynamic business environment.

Ultimately, the comparative analysis serves as a valuable resource for investors, creditors, regulatory bodies, and corporate decision-makers, offering insights into the predictive power and practical implications of different predictive models in assessing corporate failure in Malaysia. As the Malaysian economy continues to evolve, robust risk assessment frameworks informed by advanced analytics and domain knowledge will play an increasingly vital role in safeguarding financial stability and promoting sustainable growth.

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