Data Analytics: An Integrated Financial Analysis Framework to Measure the Financial Health of Prospective Pakistani Defense Contractors

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Abstract

Pakistan has the sixth-largest military in the world, and its armed services need a consistent and reliable supply of defense stores for daily operations. The Ministry of Defense invests billions of Pakistan rupees in acquisition programs yearly. Yet, contractors' defaults result in inefficient utilization of limited financial resources restricting the warfighter's capabilities. To reduce the possibility of awarding contracts to contractors who may not have the financial capability, this research found that financial analysis tools are missing in existing Pakistan defense procurement policies. This research developed an Integrated Financial Analysis Framework based on widely used financial analytical tools, including global, ratio, and multivariate analyses and applied to selected companies for illustration. With this Framework, Pakistani defense contracting officers are equipped with the financial tools to assess the financial health of prospective contractors before awarding a contract. The Framework can also be applied by the DoD/DoN acquisition workforce to assess the financial health of any potential defense contractor.
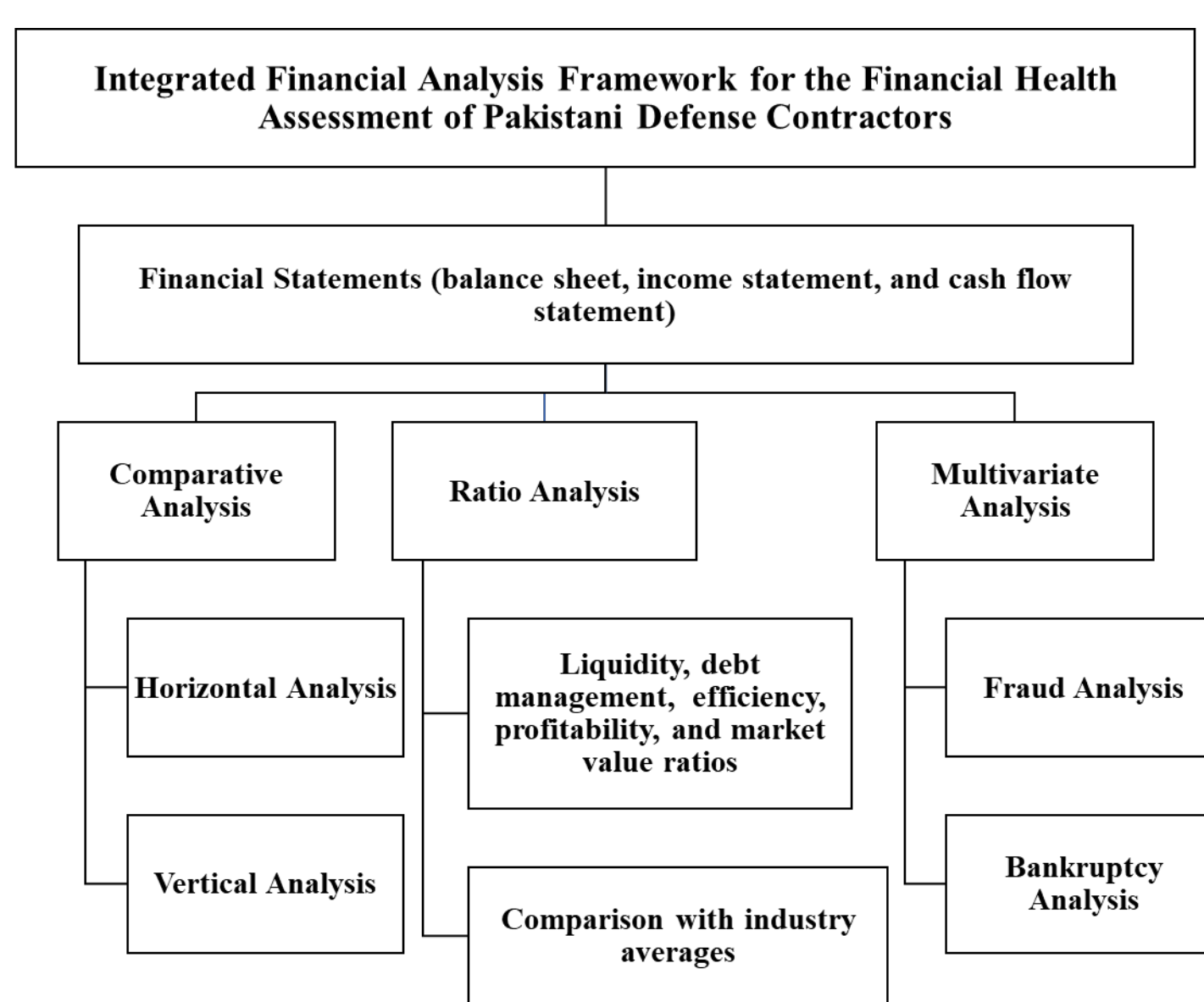
INTEGRATED FINANCIAL ANALYSIS FRAMEWORK

Methods

- Literature review
- Identification of financial statement health indicators
- Utilization of commonly used financial analysis tools
- Developed Integrated Financial Analysis Framework specific to the textile industry
- Application on publicly traded companies from the Pakistan textile industry to provide an illustration for implementation

Results & Their Impact

- What financial statement ratios can be utilized to analyze financial health?
- What financial health indicators can be identified from financial statements?
- What financial factors indicate inappropriate financial statement behavior?
- What key financial indicators are possible red flags about potential bankruptcy?

Categories of Ratios	Indicators of Financial Health
Liquidity	Cash and cash equivalent, trade debts, inventory, short term borrowings, current liabilities
Debt Management	Total liabilities including current liabilities and non-current liabilities, total assets including current assets and non-current assets, and shareholder's equity.
Efficiency	Sales generated, cost of goods sold, inventory, and total assets.
Profitability	Net income, sales, and total assets
Market Value	Net income, average shares outstanding, market price of shares, and dividends paid

FINANCIAL HEALTH RATIOS AND INDICATORS

$$Z = 1.2X_1 + 1.4X_2 + 3.3X_3 + 0.6X_4 + 1.0X_5.$$

ALTMAN'S BANKRUPTCY RATIO (Z-SCORE)

$$M\text{-score} = -4.84 + 0.920(\text{DSR}) + 0.528(\text{GMI}) + 0.404(\text{AQI}) + 0.892(\text{SGI}) + 0.115(\text{DEPI}) - 0.172(\text{SGAI}) + 4.679(\text{Accruals}) - 0.327(\text{LEVI}).$$

DR. BENEISH's FRAUD RATIO (M-SCORE)

Recommendations

- Maintain financial data repository
- Perform a comparative analysis
- Perform ratio analysis and compare with industry averages
- Identify financial health indicators
- Perform Z-score bankruptcy analysis and M-score fraud analysis

Acquisition Research Program

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