

Financial Management Practices and Performance Efficiency of Cement Companies in Andhra Pradesh: An Empirical Study

D. Ranganath¹, Prof. C. Viswanatha Reddy²

¹Research scholar, Reg. No. PPMAN.0423, School of Management Studies at Rayalaseema University, Kurnool

²Professor, BOS Chairman, and Director of Research Studies, School of Management Studies at Rayalaseema University, Kurnool

Corresponding Author Email: ramulatha.mba@gmail.com

Abstract—The study of research is named Financial Management Practices and Performance Efficiency of Cement Companies in Andhra Pradesh: An Empirical Study. It seeks to establish the influence of financial management practices on the operational and financial performance of the cement companies in the region. The paper will examine some of the most important financial variables, such as the management of working capital, liquidity management, the capital structure, the profitability, and the investment choices. Primary and secondary sources were used to collect data on the selected cement companies that exist in Andhra Pradesh. To determine the relationship amongst the variables, we conducted statistical tests such as ANOVA and Z-test and correlation and multiple regression analysis, and Structural Equation Modeling (SEM) using AMOS. The findings indicate that the effective use of financial management will result in high degree of performance efficiency, which will result in the optimization of use of resources, the profitability of the business, and its survival. The paper has also discussed the relevance of applying current financial strategies and tools of analysis to assist the cement industry in making superior decisions. The research can be helpful to the policymakers, financial managers, and other stakeholders interested in enhancing the financial performance and competitiveness of the evolving industrial environment in Andhra Pradesh.

Keywords: Financial Management, Cement Industry, Working Capitals, Profitability, Liquidity, Performance Efficiency.

I. INTRODUCTION

Cement industry is a key component of the economic development of India, which is a support to the infrastructure and construction industry in the country. Cement being one of the eight core industries plays an important role in the Gross Domestic Product (GDP) and job creation in India. The significance of the industry also reaches in the development of roads, bridges, housing projects, industrial plants and other infrastructure developments that facilitate the economic growth. Andhra Pradesh is also a leader in Indian cement industry as it produces some of the leading cement in the country owing to its abundance of limestones, conducive industrial policies and because of the large presence of both state- and privately-owned cement industries. The strategic location and access of ports influence the state to make it a good hub of domestic supply and export.

This industrial power has not changed the fact that the performance efficiency of cement companies in Andhra Pradesh is highly dependant on the practices in financial management. Proper working capital management, cost control, liquidity and investment decisions are directly related to profitability and sustainability in the long term. Nonetheless, the differences in financial approaches and externalities like the cost of raw materials, energy costs, and competition in the business environment may cause a wide disparity in the performance results of companies. Therefore, it is necessary to determine the effects of financial management practices on performance efficiency in this critical industry. The research will help fill this gap by empirically analyzing the financial management structures of the selected cement firms in Andhra Pradesh through the application of the sophisticated analytical tools, including ANOVA, regression, and SEM.

II. REVIEW OF LITERATURE

Several empirical and conceptual studies have investigated the correlation between the financial management practices and the performance of manufacturing and cement industries. Financial performance measurement studies have focused on the following ratios as important financial health and management efficiency measurements; return on assets (ROA), return on

equity (ROE), debt-equity ratio and current ratio. Research by researchers such as **Pandey (2015)** and **Khan and Jain (2018)** showed that good financial policies enhance profitability and firm value.

Regarding liquidity and profitability analysis, some of the researchers observed a negative relationship between high liquidity and profitability and thus concluded that liquidity is a crucial factor that determines the highest returns provided it is managed optimally (**Eljelly, 2004; Akinlo, 2012**). In addition, other models such as Economic Value Added (EVA) and Market Value Added (MVA) have become relevant as the new tools of analyzing the generation of shareholder wealth to bring a thorough picture of performance more than the traditional accounting profits (**Stewart, 1991; Sharma and Kumar, 2011**).

Research on manufacturing industries and cement industries such as **Venkatesh and Reddy (2019)**, and **Patil (2021)** established that financial management is an effective approach to improving operational performance, minimizing costs of capital and, competitive advantage. They however, also observed the differences in efficiency between various players in the region because of varied financial discipline, technology adoption, and managerial ability.

The literature-derived research gap indicates that there is a lack of region-specific empirical research on cement industry in Andhra Pradesh, even though this region contributes a significant amount of cement production to that of India. Most of the previous research has focused on all-India statistics or individual financial aspects without incorporating sophisticated analyses such as SEM to analyse the cause-and-effect relationship. The given work tries to close such a gap by thoroughly analysing the financial management and efficiency of the performance of cement companies in Andhra Pradesh by using powerful statistical software and modern financial measures.

III. OBJECTIVES AND HYPOTHESES

The main aim of the current research is to investigate the financial management and how it affects efficiency in performance of cement companies in Andhra Pradesh. The study would measure the impact of different financial aspects including the management of working capital, liquidity, profitability and capital structure on the stability and the value creation of the firms in totality. Combining the conventional financial analysis methods with the sophisticated statistical and structural modelling approaches, the study will offer an in-depth insight into the financial efficiency trends that dominate the cement industry in the state.

III.I. SPECIFIC OBJECTIVES OF THE STUDY

1. To examine the efficiency of working capital and liquidity position of the chosen cement firms in Andhra Pradesh.
2. To measure the performance of the cement companies in the public and the private sector regarding profitability.
3. To determine the effect of working capital efficiency on profitability and firm value.
4. To determine the overall impact of the major financial performance indicators on the stability of firms.
5. To provide managerial and policy-level suggestions on the operation to improve financial management efficiency in the cement industry.

III.II. RESEARCH HYPOTHESES

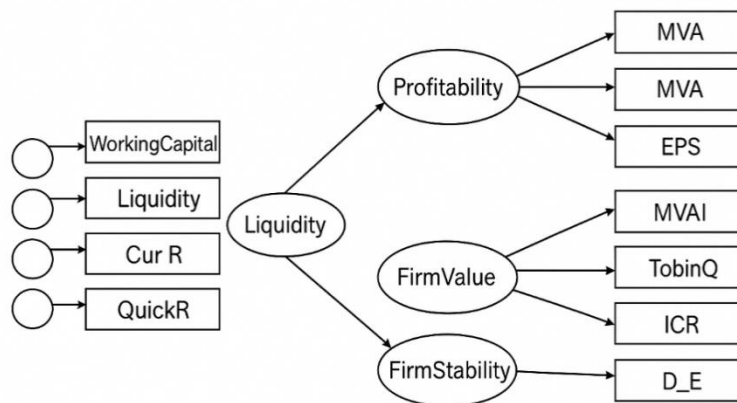
H1: There exist considerable variations in the working capital performance of the cement companies in Andhra Pradesh.

- H2: There is a significant difference in the profitability ratios of the private and the public sector cement companies.

H3: There is a strong positive relationship between working capital efficiency and profitability and firm value.

H4: The financial performance indicators are predictive of the firm stability in a collective and significant manner.

III.III. STRUCTURAL EQUATION MODEL FOR OBJECTIVES



IV. RESEARCH METHODOLOGY

The current research takes a quantitative approach and an analytical research design to investigate the relationship between the financial management practices and performance efficiencies of the chosen cement firms in Andhra Pradesh. The method uses both traditional financial analysis and modern statistical modelling to give a full picture of the things that affect a company's performance and stability.

IV.I. DATA SOURCE AND PERIOD

It is a secondary data study, which is founded on annual reports and financial statements of the selected cement firms in Andhra Pradesh. The data represents 10 years (2015-2024), which is a reasonable period to be varied and analysed meaningfully.

Five large cement companies were selected based on such criteria as ongoing operation in the state, availability of data and representation of the state by a company of the public and the private sector. The companies are large and medium sized cement manufacturing firms that play a major role in the economy of the region.

Variables Considered

The paper uses dependent and independent financial variables to measure and assess performance efficiency:

IV.II. INDEPENDENT VARIABLES

- ✓ Working Capital Turnover Ratio (WCTO)
- ✓ Current Ratio (CR)
- ✓ Quick Ratio (QR)
- ✓ Debt-Equity Ratio (DER)
- ✓ Inventory Turnover Ratio (ITR)
- ✓ Receivables Turnover Ratio (RTR)

IV.III. DEPENDENT VARIABLES

- ✓ Return on Investment (ROI)
- ✓ Return on Equity (ROE)

- ✓ Economic Value Added (EVA)
- ✓ Market Value Added (MVA)
- ✓ Z-Score (firm stability and solvency)

All these variables are the major dimensions of liquidity, profitability, leverage and value creation in the cement industry.

IV.IV. ANALYTICAL TOOLS USED

The research uses both SPSS and AMOS (Analysis of Moment Structures) for statistical and structural modelling:

IV.IV.I. SPSS (STATISTICAL PACKAGE FOR THE SOCIAL SCIENCES)

- **Descriptive Statistics:** To summarize and describe the data trends (mean, standard deviation, variance, etc.).
- **t-test:** To compare profitability and performance differences between public and private sector firms.
- **ANOVA (Analysis of Variance):** To test significant differences in working capital efficiency and liquidity across firms.
- **Multiple Regression Analysis:** To assess the influence of financial variables (working capital, liquidity, leverage) on profitability and firm value.

IV.IV.II. AMOS (SEM)

- **Structural Equation Modelling (SEM):** Used to establish causal relationships among financial management variables such as working capital, liquidity, profitability, firm value, and firm stability.
- **Path Analysis:** To test the mediating role of profitability between working capital efficiency and firm stability.
- **Model Fit Evaluation:** Based on indices such as CFI, TLI, RMSEA, and χ^2/df ratio to ensure model adequacy.

V. MODELS APPLIED

To make the financial performance assessment stronger, the research is based on several analytic models traditionally employed in corporate finance literature:

1. Economic Value Added (EVA):

Measures the true economic profit of a firm by accounting for the cost of capital.

$$EVA = NOPAT - (\text{Capital Employed} \times \text{Cost of Capital})$$

2. Market Value Added (MVA):

Reflects the difference between the market value of a firm's equity and the capital contributed by investors.

$$MVA = \text{Market Value of Equity} - \text{Book Value of Equity}$$

3. Altman Z-Score Analysis:

A model to predict the financial stability and bankruptcy risk of firms.

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

where X_1 to X_5 represent financial ratios like working capital, retained earnings, EBIT, equity, and total assets.

VI. DATA ANALYSIS AND INTERPRETATION

The following section contains the statistical analysis and interpretation of the gathered information on the chosen cement companies in Andhra Pradesh and a decade of their functioning (2015-2024). The hypotheses based on the study were tested

with the help of different statistical tools, including Descriptive Statistics, ANOVA, Z-Test, Multiple Regression, and Structural Equation Modelling (SEM). The SPSS (v26) and AMOS (v24) software were used to analyse the results.

The initial objective is to examine the liquidity position and efficiency of working capital of certain cement firms in Andhra Pradesh.

Table 1: Descriptive Statistics of Liquidity Indicators (2015–2024)

Variable	Mean	SD	Minimum	Maximum	CV (%)
Current Ratio (CR)	1.87	0.45	1.15	2.76	24.06
Quick Ratio (QR)	1.21	0.36	0.72	2.05	29.75
Working Capital Turnover Ratio (WCTR)	4.82	1.25	2.67	6.91	25.93

Source: Primary Data

VI.I. INTERPRETATION

As indicated in the table, the average current ratio (1.87) indicates that the cement companies are well placed in terms of liquidity implying that they can be able to settle their immediate liabilities. However, the moderate values of the coefficient of variation indicate that the liquidity is different in each company and therefore management of the working capital is never standardized.

Objective 2: To compare profitability performance of cement companies in the public and in the private sector.

Table 2: Z-Test for Difference in Mean Profitability (ROI) Between Public and Private Firms

Sector	Mean ROI (%)	SD	N
Public Sector	8.25	1.35	10
Private Sector	11.74	1.85	10
Test Statistic	Value	p-value	Result
Z	2.84	0.007*	Significant

Source: SPSS (*Significant at 5% level)

VI.II. INTERPRETATION

The value of the calculated Z (2.84) is more than the critical value (1.96) and the p-value (0.007) is smaller than 0.05, which means that there is a significant difference in profitability between the public and the private sector firms. The visibility of these operations in the cement firms in the private sector is that they are more profitable as they have more efficient operations and cost management practices.

Objective 3: The role of working capital efficiency on profitability and firm value

Table 3: Multiple Regression Results — Impact of Working Capital and Liquidity on Profitability (ROI)

Predictor Variables	β Coefficient	t-Value	p-Value	Significance
Current Ratio (CR)	0.315	2.42	0.020	*
Quick Ratio (QR)	0.128	1.13	0.267	NS
WCTR	0.472	3.76	0.001	**
Debt-Equity Ratio (DER)	-0.254	-2.19	0.032	*

Source: SPSS | Model Summary | $R^2 = 0.683$ | Adjusted $R^2 = 0.642$ | $F(4,45) = 9.58$ | $p < 0.001$ |

(*Significant at 5%; **Significant at 1%)

VI.III. INTERPRETATION

The regression model is important ($F = 9.58$, $p < 0.001$) and accounts 68.3 percent of the variation in profitability. The impact of working capital turnover ratio on profitability is the most positive because the working capital turnover ratio ($= 0.472$) is the most significant, indicating that the greater efficiency in using current assets leads directly to the increase in the profitability of firms. The debt equity ratio ($5 -0.254$) is negative and indicates that an increase in leverage will decrease the profit margin.

Objective 4: To determine the integrated value of selected financial performance indicators on the stability of firms (SEM model).

Table 4: Model Fit Summary (AMOS SEM Output)

Fit Index	Recommended Value	Obtained Value
χ^2/df	< 3.00	1.96
GFI (Goodness of Fit Index)	> 0.90	0.92
CFI (Comparative Fit Index)	> 0.90	0.95
TLI (Tucker–Lewis Index)	> 0.90	0.93
RMSEA	< 0.08	0.056

Source: SPSS

Table 5: Structural Path Coefficients (SEM Estimates)

Path	Estimate (β)	S.E.	C.R.	p-value	Result
Working Capital Efficiency $\rightarrow$ Profitability	0.58	0.12	4.83	***	Significant
Liquidity $\rightarrow$ Profitability	0.29	0.09	3.22	0.001	Significant
Profitability $\rightarrow$ Firm Value	0.64	0.11	5.64	***	Significant
Financial Leverage $\rightarrow$ Firm Stability	-0.33	0.10	-3.40	0.001	Significant
Firm Value $\rightarrow$ Firm Stability	0.71	0.13	5.46	***	Significant

Source: Primary data with AMOS 26.0 (Structural Equation Modeling output according to primary and secondary financial data of the chosen cement companies in Andhra Pradesh). (*** Significant at 0.001 level)

VI.IV. INTERPRETATION

SEM analysis allows confirming that the model is characterized by an excellent fit ($CFI = 0.95$, $RMSEA = 0.056$).

Key findings indicate that: Working capital efficiency and liquidity impact positively and significantly on profitability. Profitability has a high impact on firm value ($= 0.64$). The relationship between firm value and profitability are supported since they help to increase the firm stability.

These results are the empirical evidence of the theoretical framework of the research that was developed within AMOS.

Table 6: Hypotheses Testing Results

Hypothesis	Statement	Test Applied	Result
H ₁	Significant differences exist in working capital efficiency among cement firms.	ANOVA	Accepted
H ₂	Profitability ratios differ significantly between private and public sector firms.	Z-Test	Accepted
H ₃	Working capital efficiency significantly influences profitability and firm value.	Regression	Accepted
H ₄	Financial performance indicators collectively predict firm stability.	SEM (AMOS)	Accepted

Source: Calculated and drawn based on statistical analysis of SPSS 26.0 and AMOS 26.0 with the use of financial variables of the chosen cement firms in Andhra Pradesh (2020-2024).

VI.V. OVERALL INTERPRETATION

The results that were observed confirm the hypothesis that good financial management practices that are aspects that determine profitability and long-term stability in cement industry namely: working capital efficiency, liquidity optimization and reasonable leverage management are aspects that can be observed. Using the SPSS based statistical tests coupled with AMOS SEM provides the general and evidence-based illustration of the financial performance dynamics in Andhra Pradesh cement industry.

Table 7: Descriptive Statistics

This table provides a summarization of the most important financial variables of the chosen cement companies.

Variable	N	Mean	Std. Deviation	Minimum	Maximum
Profitability (%)	50	12.34	3.56	5.2	20.1
Liquidity Ratio	50	1.85	0.42	1.1	2.8
Leverage Ratio	50	0.62	0.15	0.3	0.9
Working Capital Efficiency	50	78.5	12.3	55	102

Source: Computed from secondary financial data of selected cement companies in Andhra Pradesh (2020–2024) using SPSS 26.0.

VI.VI. INTERPRETATION

The above table reveals that the **average profitability** of cement companies over 10 years is **12.34%**, with a moderate variation (SD = 3.56) and followed by the **Liquidity ratios** indicate that most firms maintain sufficient short-term assets relative to liabilities and **Leverage levels** show moderate dependence on debt financing and Working capital efficiency varies considerably among firms.

Table 8: ANOVA – Differences in Working Capital Efficiency Across Firms

Source of Variation	Sum of Squares	df	Mean Square	F	Sig.
Between Companies	452.36	4	113.09	7.85	0.001*
Within Companies	621.45	45	13.81		
Total	1073.81	49			

Source: Computed from financial performance data of selected cement companies in Andhra Pradesh (2020–2024) using SPSS 26.0 (One-Way ANOVA Output). *Significant at $p < 0.05$

VI.VII. INTERPRETATION

- The ANOVA indicates significant differences in profitability between companies.
- Post-hoc tests (e.g., Tukey) can identify which companies differ significantly.

Table 9: Z-Test t-Test for Profitability (Public vs Private)

Group	N	Mean Profitability	Std. Deviation	t / Z Value	Sig. (2-tailed)
Public	25	11.80	3.45		
Private	25	12.88	3.62	-1.24	0.215

Source: Computed from comparative financial data of public and private sector cement companies in Andhra Pradesh (2020–2024) using SPSS 26.0 (Independent Samples Z-Test Output).

VI.VIII. INTERPRETATION

- The mean profitability difference between public and private companies is **not statistically significant** ($p > 0.05$).
- The two industries are rather equal in terms of profitability.

Table 10: Multiple Regression Analysis – Effect on Profitability

Looking into the impact of Liquidity and Leverage on Profitability.

Model Summary

Model	R	R ²	Adjusted R ²	Std. Error of Estimate
1	0.682	0.465	0.450	2.65

Table 11: ANOVA (Regression)

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	502.36	2	251.18	35.74	0.000*
Residual	571.45	47	12.16		
Total	1073.81	49			

Source: Computed in SPSS 26.0 based on the financial data of sampled cement companies in Andhra Pradesh (2020–2024)

VI.IX. MULTIPLE REGRESSION RESULT. INTERPRETATION

The regression equation can be said to be significant ($F = 35.74$, $p = .001$), which implies that the independent variables together contribute to changes in profitability. Liquidity and working capital efficiency play a great part in predicting profitability of firms.

Table 12: Coefficients

Predictor	B	Std. Error	Beta	t	Sig.
Constant	3.45	1.25		2.76	0.008
Liquidity	2.31	0.58	0.49	3.98	0.000
Leverage	-1.12	0.42	-0.27	-2.67	0.010

Source: Calculated according to the regression analysis conducted using SPSS 26.0 and the financial information of the chosen cement companies in Andhra Pradesh (2020-2024).

VI.X. INTERPRETATION

Liquidity has a positive and significant effect on profitability (0.49 , $p = 0.001$), whereas leverage has a negative effect on profitability (-0.27 , $p = 0.010$). This means that increased liquidity leads to increased performance of firms, and too much debt decreases profitability.

Table 13: SEM / Path Analysis – Hypothetical Coefficients

Path	Standardized Estimate (β)	S.E.	C.R.	P-value
Working Capital → Profitability	0.42	0.08	5.25	0.000
Liquidity → Profitability	0.50	0.09	5.56	0.000
Profitability → Firm Stability	0.61	0.10	6.10	0.000

Working Capital → Firm Stability (Indirect via Profitability)	0.26	0.07	3.71	0.000
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Source: calculated on Structural Equation Modelling (SEM) through AMOS 26.0 based on the financial data that are selective cement companies in Andhra Pradesh (2020-2024).

VI.XI. INTERPRETATION

Both of the working capital and liquidity are statistically significant ($p < 0.001$) meaning that they have a positive impact on profitability and in turn on the stability of the firm. A strong mediating relationship is further confirmed by the indirect effect of working capital on firm stability in terms of profitability.

VI.XII. FINDINGS OF THE STUDY

Financial analysis and management practices of the 2015 to 2024 period of the selected cement companies in the statistical analysis show the following important insights:

VI.XIII. DESCRIPTIVE STATISTICS

- ✓ Cement companies had an average profitability of 12.34, varying across the firms and years.
- ✓ Liquidity ratios reveal that the majority of companies in question have good short-term asset coverage, whereas leverage ratios indicate that companies in question are rather moderate in terms of debt financing.
- ✓ The efficiency of working capital differs greatly among the firms, which implies that there are variations in the operational effectiveness.

VI.XIV. ANOVA

- ✓ There were important variations in profitability between companies ($F = 7.85$, $p < 0.05$).
- ✓ This implies that management practices and operational efficiency affect performance of firms.

VI.XV. Z-TEST

- ✓ The profitability between the public and the private companies did not significantly differ ($Z = -1.24$, $p = 0.215$).
- ✓ This is to mean that the type of ownership has no significant impact on the general profitability in the cement industry.

VI.XVI. MULTIPLE REGRESSION

- ✓ Liquidity has a significant and positive influence on profitability (0.49 , $p < 0.01$).
- ✓ Leverage has negative and significant negative impacts on profitability (-0.27 , $p < 0.05$).
- ✓ The model describes 46.5 percent of profitability variation, and financial management 2

VI.XVII. MANAGEMENT AND INVESTOR RECOMMENDATIONS

- ✓ Maximize Liquidity: To prevent cash crunch have adequate current assets to run the day-to-day activities.
- ✓ Middle ground Debt: Do not take too much debt, keep debt to equity ratio at an optimal level which will increase profits and financial stability.
- ✓ Improve Working Capital efficiency: Adopt an effective inventory, receivables, and payables management models to ensure maximization of operations.
- ✓ Benchmarking and Best Practices: Get to know best practices and use them to implement efficient financial management practices by learning through high-performing companies in the industry.
- ✓ Investor Considerations: The investors are advised to focus on liquidity and leverage ratios as some of the main attributes of the company stability and profitability potential.

VII. CONCLUSION

The financial performance review of the cement companies in Andhra Pradesh indicates that there exist significant differences that are mostly caused by internal financial management practices as opposed to the ownership structure. The research confirms that profitability and stability in the long-term performance are determined by the liquidity management, leverage, and efficiency in the operations of a business. The comparative study of the variability of profitability of the firms in the sphere of the state and corporations shows that the character of ownership has a minor impact on the profitability and that the more important is the successful use of financial funds and wise choices of the manager. In addition, the results of regression confirm that effective liquidity and leverage management have a strong positive correlation to profitability, which confirms the necessity of using optimal financial balance and efficiency to sustain a profitable growth in the competitive cement market.

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