

Impact of Financial Variables on the profitability of Selected Ceramic Industries of India

Mr. Jay A. Sathavara

jaysathvara@gmail.com, At- Idar, Gujarat, India

Abstract: The main purpose of this research paper to analyze impact of financial variables on the profitability of selected ceramic industries of India. The study also analyzed there is significant difference between dependent variable and independent variables and also predict financial model to increase profitability of ceramic industry in future. The net profit to total assets ratio was considered as the dependent variable representing financial performance. This study included top 4 major ceramic industries of India namely Asian Granito India Ltd, Kajaria Ceramic Ltd, Cera Sanitaryware Ltd and HSIL limited on the basis of their market capitalization. The study involved two stage analysis, in first stage two sample assuming equal variance T- test was used to investigate significant difference between dependent variable and independent variables. In the second stage, Pearson Correlation and Multiply Regression analysis was used to predict profitability of industries. There was a statistically difference in three financial variables out of seven variable in paired t test assuming equal variances. Our study found that all ratios are working well together to increase profitability of ceramic industry. In Pearson correlation test NP/TA ratio has significant correlation with TD/TA ratio, CA/NWC ratio, LA/LL ratio and SA/Sales ratio. Profitability model was developed by with the help of regression model and this model helps to industry to increase their profitability in future.

Key Words: Ceramic Industries, Performance and profitability.

1. Introduction

The ceramic sector in India experiencing high growth because of real estate sector booming in India. Top buildings, flats, malls, multiplex, roads, bridges and top statues are the identification of growth of new India. Cement industries, steel industries and ceramic industries also growing in India because of growth of real estate sector. India's ceramic sector is second in terms of growth in world next to China. Lots of research was done on cement industries and steel industries of India and now it's time to do research on ceramic industries to determine its profitability. Ceramic industries provide large number of employment in India and this way ceramic sector play very useful

role for healthy economy. Asian Granito India Limited (AGL) was established in 2000 and has market capitalization of Rs. 542.03 Cr, total assets of Rs. 1187.26 Cr, net profit of Rs. 55 Cr, and providing employment to around 2600 employees. Kajaria was established in 1988 and has market capitalization of Rs. 8939.36 Cr, total assets of Rs. 2140.29 Cr, net profit of Rs. 228 Cr and providing employment to around 2700 employees. CERA sanitary was established in 2002 and has market capitalization of Rs. 3511.78 Cr, total assets of Rs. 1046.06 Cr, net profit of Rs. 106.12 Cr and providing employment to around 2500 employees. HSIL was established in 1960 and has market capitalization of Rs. 1966.46 Cr, total assets of Rs. 3560.44 Cr., net profit of Rs. 70 Cr. and providing employment to around 4100 employees.

2. Objectives of the Research Study

The following are objectives:

- 1) To study impact of financial variables on the profitability of selected ceramic industry in India.
- 2) To measure performance of ceramic industry.
- 3) To study relationship between the profitability of ceramic industry and the variables.

3. Research Methodology, Hypothesis and Variables

The present study evaluate the impact of independent variables on profitability. The sample consists major four ceramic industry of India namely Asian Granito India Limited (AGL), Kajaria Ceramic Ltd, Cera Sanitaryware Ltd and HSIL limited on the basis of their market capitalization. Secondary data related to this

industries were obtained from annual reports of the company from their respective websites for the period from 2008-09 to 2017-18. In terms of profitability of selected ceramic industry measured in terms of net profit to total assets ratio.

This research study is divided in two stages. The first stage deals with to find out significant difference between profitability, liquid ratio, working capital ratio, new investment in fixed assets ratio and others major expenses ratios. To complete this first stage paired T test assuming equal variances is used. The second stage deals with to find out relationship between dependent variable and independent variables with the help of Pearson’s correlation coefficient at 0.01 and 0.05 significant levels. Multiple regression analysis is also used to study relationship of independent variables with dependent variable. At last profitability model developed for the ceramic industry which helps to industry increase their profitability in future. SPSS and Microsoft Excel used as a statistical tool.

Variables

Table 1: Dependent Variable and Independent Variables

Dependent Variable	Independent Variables
Net Profit to Total Assets Ratio (NP/TA)	Total Debt to Total Assets Ratio (TD/TA)
	Current Assets to Net Working Capital Ratio (CA/NWC)
	Change in Gross Fixed Assets to Sales Ratio (GFA/Sales)
	Liquid Assets to Liquid Liability Ratio (LA/LL)
	Employee Benefits Expenses to Sales Ratio (EBE/Sales)
	Power & Fuel Expenses to Sales Ratio (PF/Sales)
	Selling & Administrative Expenses to Sales Ratio (SA/Sales)

4. Analysis, Result and Discussion

Table 2 indicates financial ratios of selected samples of last 10 years from 2008-09 to 2017-18. In this table NP/TA ratio is dependent ratio. NP/ TA ratio means how much net profit after tax earns by the industry over the total assets. Lowest NP/TA ratio in the year 2008-09 was 5.25% and highest in the year 2016-17 was 7.42%. TD/TA ratio means how much debt taken by the

Hypotheses

There are seven hypotheses developed to check significant difference.

There is no significant difference between-

- 1) H01: NP/TA ratio to TD/TA ratio.
- 2) H02: NP/TA ratio to GFA/ Sales ratio.
- 3) H03: NP/TA ratio to CA/ NWC ratio.
- 4) H04: NP/TA ratio to LA/ LL ratio.
- 5) H05: NP/TA ratio to EBE / Sales ratio.
- 6) H06: NP/TA ratio to PF/Sales ratio.
- 7) H07: NP/TA ratio to SA/ Sales ratio.

industry over the total assets. Higher ratio indicates bad for the industry and lower ratio indicates good for the industry. Highest TD/TA ratio was 39.92% in the year of 2008-09 and lowest in the year of 2017-18 was 13.86% and it was continues decreased from 2008-09 to 2017-18. CA/NWC ratio was 1.66 in the year of 2008-09 (lowest) and 3.72 in the year of 2015-16 9 (highest). GFA/Sales ratio means industry’s new investment in fixed

assets during the year. Highest GFA/Sales ratio secured by the industry in the year of 2009-10 was 15.79% and lowest was 4.33% in the year of 2013-14. LA/LL ratio means Acid test ratio. Highest ratio indicates good for the industry and lower ratio indicates bad for the industry. Highest LA/LL ratio was 1.54 in the year of 2009-10 and lowest ratio

was 0.85 in the year of 2015-16. EBE/Sales ratio was higher in the year of 2017-18 was 11.18% and lowest in the year of 2013-14 was 8.44%. PF/Sales ratio was 11.08% in the year of 2016-17 and 15.28% in the year of 2012-13. Highest SA/Sales ratio was 16.79% in the year of 2009-10 and lowest ratio was 10.75% in the year of 2015-16.

Table 2: Financial Ratios of Dependent Variable and Independent Variables

Result of Paired T-test

rejected. In test -5 calculated t value is -7.54 that is

Year	NP/TA	TD/TA	CA/NWC	GFA/SALES	LA/LL	EBE/SALES	PF/SALES	SA/SALES
2008-09	5.25	39.92	1.66	12.97	1.54	8.99	14.07	15.24
2009-10	6.29	33.67	1.79	15.79	1.25	8.92	13.24	16.79
2010-11	7.20	25.38	2.26	7.72	0.99	9.02	12.25	12.27
2011-12	6.82	23.21	2.55	10.44	0.98	8.91	13.81	11.98
2012-13	7.07	24.28	2.22	9.71	1.01	8.51	15.28	11.76
2013-14	6.49	21.26	2.33	4.33	0.95	8.44	14.35	11.04
2014-15	6.81	17.22	2.74	7.69	0.89	8.71	13.26	11.74
2015-16	7.28	15.93	3.72	5.45	0.85	9.73	11.27	10.75
2016-17	7.42	14.46	3.55	6.01	0.92	10.05	11.08	11.82
2017-18	6.70	13.86	2.98	5.25	1.00	11.18	11.21	12.61

Table 3 reveals the result of t-test assuming equal variances of dependent ratio NP/TA and independent ratios TD/TA, GFA/Sales, CA/NWC, LA/LL, EBE/Sales, PF/Sales and SA/Sales at 5% significant level. In test- 1 T stat value is -6.00 and that is less than T critical value of two tail that is 2.10, so alternative hypothesis rejected. In test -2 t statistics value -1.52 is less than t critical value 2.10 so null hypotheses is accepted. In test -3 test t value is 14.13 and that is higher than t table value 2.10 that means null hypothesis is rejected. In test -4 T value 27.16 is higher than t table value 2.10 so null hypotheses is

less than t table value 2.10 that means alternative hypothesis is rejected. In test -6 t value -12.39 is less than t table value 2.10 so null hypothesis is accepted. In test - 7 t calculated value -9.21 is less than t table value 2.10 so null hypotheses is accepted.

The two null hypotheses are rejected and five null hypotheses are accepted. CA/NWC and LA/LL ratio has statically difference with dependent NP/TA ratio and TD/TA, GFA/Sales, EBE/Sales, PF/Sales and SA/Sales ratios has no significant difference with dependent NP/TA ratio.

Table 3: Paired T-test assuming equal variances

Hypothesis Test	Dependent	Test-1	Test-2	Test-3	Test-4	Test-5	Test-6	Test-7
Ratios	NP/TA	TD/TA	GFA/Sales	CA/NWC	LA/LL	EBE/Sales	PF/Sales	SA/Sales
Mean	6.73	22.92	8.53	2.58	1.04	9.25	12.98	12.60
Variance	0.40	72.27	13.68	0.47	0.04	0.71	2.15	3.66
No. of Observation	10	10	10	10	10	10	10	10
Degree of Freedom		18	18	18	18	18	18	18
T Calculated Value		-6.00	-1.52	14.13	27.16	-7.54	-12.39	-9.21
T Table Value		2.10	2.10	2.10	2.10	2.10	2.10	2.10
Null Hypothesis		Accepted	Accepted	Rejected	Rejected	Accepted	Accepted	Accepted

Pearson Correlation Coefficient and Multiple Regression Analysis

Table 4 reveals on the correlation coefficient of dependent and independent financial variables at 0.01 significant levels and 0.05 significant levels. Its show that there is a significant impact on seven variables out of eight variables at different significant level except EBE/Sales. In above table NP/TA ratio is dependent ratio and TD/TA ratio, CA/NWC ratio, GFA/Sales ratio, LA/LL ratio , EBE/Sales ratio, PF/Sales ratio and SA/Sales ratio taken as independent ratios. It can be seen that from above study, coefficient for NP/TA ratio to TD/TA ratio : -0.783, TD/TA ratio to CA/NWC ratio : -0.874, TD/TA ratio to GFA/Sales ratio: 0.841, NP/TA ratio to LA/LL ratio: -0.895, TD/TA ratio to LA/LL ratio: 0.903, EBE/Sales ratio to PF/Sales ratio: -0.825, TD/TA ratio to SA/Sales

ratio: 0.784, GFA/Sales ratio to SA/Sales ratio:0.866 and LA/LL ratio to SA/Sales ratio:0.841 are significant at 1% level where as coefficient for NP/TA ratio to CA/NWC ratio: 0.721, CA/NWC ratio to GFA/Sales ratio: -0.721, CA/NWC ratio to LA/LL ratio: -0.745, GFA/Sales ratio to LA/LL ratio: 0.748, CA/NWC ratio to PF/Sales ratio: -0.738, NP/TA ratio to SA/Sales ratio: -0.693 and CA/NWC ratio to SA/Sales ratio: -0.672 are significant at 5% level. The remaining one variable EBE/Sales ratio do not have any significant impact on profitability. From this above study it can be seen that all ratios are working well together to increase profitability of ceramic industry. It can be seen that NP/TA ratio has significant correlation with TD/TA ratio, CA/NWC ratio, LA/LL ratio and SA/Sales ratio.

Table 4: Pearson Correlation Coefficient (Two Tailed)

Variables		NP/TA	TD/TA	CA/NWC	GFA/SALLES	LA/LL	EBE/SALLES	PF/SALLES	SA/SALLES
NP/TA	Pearson.	1							
	Sig.								
TD/TA	Pearson.	-.783**	1						
	Sig.	.007							
CA/NWC	Pearson.	.721*	-.874**	1					
	Sig.	.019	.001						
GFA/SALLES	Pearson.	-.572	.841**	-.721*	1				
	Sig.	.084	.002	.019					
LA/LL	Pearson.	-.895**	.903**	-.745*	.748*	1			
	Sig.	.000	.000	.013	.013				
EBE/SALLES	Pearson.	.219	-.507	.590	-.385	-.160	1		
	Sig.	.544	.135	.073	.272	.659			
PF/SALES	Pearson.	-.446	.562	-.738*	.440	.356	-.825**	1	
	Sig.	.196	.091	.015	.203	.312	.003		
SA/SALES	Pearson.	-.693*	.784**	-.672*	.866**	.841**	-.063	.159	1
	Sig.	.026	.007	.033	.001	.002	.862	.661	

** . Correlation is significant at the 0.01 level.

* . Correlation is significant at the 0.05 level.

For this study, To examine the regression model as a whole significant R² is calculated, the R² is 0.889 and adjusted R² is 0.499. Table 5 reports that 88.9% of the variation in NP/TA ratio is explained by the regression line. These result shows that this financial variables have an impact on the profitability of ceramic industry.

The regression analysis done using the following equation:

$$NP/TA(Y)=a_0+a_1(TD/TA)+a_2(CA/NWC)+a_3(GFA/SALES)+a_4(LA/LL)+a_5(EBE/SALLES)+a_6(PF/SALES)+a_7(SA/SALES)$$

Where dependent variable is NP/TA ratio.

Table 5: Model Summary

Model	R	R ²	Adjusted R ²	Standard Error	Change Statistics				
					R ² Change	F Change	df1	df2	Significant F Change
1	.943 ^a	.889	.499	.4456515	.889	2.280	7	2	.339

a. Predictors: (Constant), SA/SALES, EBE/SALES, PF/SALES, LA/LL, GFA/SALES, CA/NWC, TD/TA

Table 6: Multiple Regression Analysis

Model	Unstandard Coefficients		Standard Coefficients	t	Significant	95.0% Confi. Interval for B	
	B	Standard Error	Beta			Lower Bound	Upper Bound
1 (Constant)	10.134	12.376		.819	.499	-43.117	63.384
TD/TA	.048	.127	.645	.375	.744	-.500	.595
CA/NWC	-.021	.869	-.023	-.024	.983	-3.760	3.718
GFA/SALES	.081	.159	.473	.508	.662	-.602	.763
LA/LL	-4.142	4.117	-1.365	-1.006	.420	-21.857	13.572
EBE/SALES	.233	.590	.313	.395	.731	-2.305	2.772
PF/SALES	-.095	.384	-.222	-.248	.827	-1.746	1.555
SA/SALES	-.138	.371	-.420	-.373	.745	-1.733	1.456

a. Dependent Variable: NP/TA

The multiple regression analysis done using the following equation:

$$NP/TA (Y) = 10.134 + 0.048(TD/TA) - 0.021(CA/NWC) + 0.081(GFA/SALES) - 4.142(LA/LL) + 0.233 (EBE/SALES) - 0.095(PF/SALES) - 0.138(SA/SALES)$$

5. Limitations of the study

- 1) The study is limited to only four samples of ceramic industries to determine impact of financial variables on profitability of ceramic industries and its also limited to 10 years only.
- 2) Only financial data is used in this study. Qualitative and external affairs are ignored.
- 3) Only power and fuel, Wages and Selling and administrative of profit and loss accounts variables are considered and others variables of expenses are ignored.

6. Conclusion and Scope for Further Research

The research study has done with to find out significant differences in accounting and financial ratios using t test using equal variances and its found that two variables current assets to net working capital and liquid assets to liquid liability are to be statistically significant at 5% level out of seven variables. In second stage of the study, there is a significant impact on seven variables out of eight variables at different significant level in Pearson correlation coefficient at 0.01 and 0.05 significant levels. Profitability model was developed with the help of multiple regression analysis. We hope this study would helps to BoD

of the industry, investors, shareholders, policy makers and future researcher.

The present study used only some financial variable to find out their impact on profitability. Similar kinds of study can be done using all financial variables. The present study is done with internal factors. Similar kinds of study can be done using both internal and external factors. Further scope of the study can be done with using stock price movement of the industry. Further study may also do with ceramic industries from other countries.

7. References

Annapurna V. & Manchala G. (2017). Balanced Scorecard Evaluation of the Performance of Indian Public Sector Banks. *Indian Journal of Finances*, 9(11), 7-21.

Hardeep. (2016). Performance appraisal system in ceramic tiles industry in India special reference to employees productivity. *The thesis submitted to Maharshi Dayanand University*.

Joshi N. & Desai J. (2019). Financial Restructuring and its Impact on Operating Performance in the Energy Sector in India. *Indian Journal of Finances*, 13(1), 37-54.

Santosh S. & Ranjith V. (2018). Determinants of Capital Structure: An Exclusive Study of Passenger Car Companies in India. *Indian Journal of Finances*, 12(5), 43-53.

Websites

<https://www.moneycontrol.com/stocks/marketinfo/marketcap/bse/ceramics-granite.html?classic=true>
<https://www.moneycontrol.com>

Annual Reports

1. Annual Reports of AGL from 2009-10 to 2017-18.
2. Annual Reports of Kajaria Tiles from 2009-10 to 2017-18.
3. Annual Reports of CERA Ltd. from 2009-10 to 2017-18.
4. Annual Reports of HSIL Ltd. from 2009-10 to 2017-18