



International Journal of Economic Research

ISSN : 0972-9380

available at <http://www.serialsjournals.com>

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Volume 14 • Number 14 • 2017

Industrial Characteristics Analysis using Cluster Model

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ABSTRACT

In this study an attempt is made to examine the reasonableness of certain industry-wide accounting data in finding out industry characteristics of 32 industry groups in two digit code belongs to state of Andhra Pradesh according to ASI reports during the period from year 1998-99 to 2012-13. Results show that out of 16 selected industry groups, 12 industry groups are in cluster 1, one industry is in cluster 2, showing good performance, 2 industry groups are in cluster 3, showing average performance and one industry is in cluster 4 showing worst performance with respect to mean and CV of selected financial parameters. The result of this research will definitely useful to the policy makers, especially the government to know the functionality of the different industries working in Andhra Pradesh.

Keywords: Financial ratios, homogeneity, heterogeneity, industry characteristics, operating efficiency, statistical grouping.

1. INTRODUCTION

The broadly utilized measure of proficiency of mechanical units is efficiency, which is measured as far as capital, work or, what goes for the sake of aggregate variable profitability. The reality of the matter is that efficiency is an essential measure. A unit that performs well as far as efficiency development ought to keep up a decent budgetary wellbeing. There are, be that as it may, certain better issues concerning internal quality of a unit's money related wellbeing. These are for the most part influence, obligation and enthusiasm adjusting limit, rate of profitability, working capital administration proficiency and liquidity of a mechanical unit. These issues are once in a while tended to in a monetary investigation. Accounting ratios utilized by monetary experts to evaluate budgetary wellbeing of an organization may build up a better comprehension

about money related execution of an industry bunch. Monetary examiners get these proportions from yearly reports of those organizations. The Center for Monitoring Indian Economy (CMIE) crawlers utilized for proportions examination. These proportions can, nonetheless, not be gotten from ASI information base which gives industry level information at large scale level. This is on account of the way ASI present the information does not entirely take after the dialect of a money related expert. In this paper, the study build up these money related proportions at full scale level, looking for a correspondence between the bookkeeping numbers and essential industry attributes. Keep as a top priority the definition given by budgetary examiner for the monetary proportions and pick the synonymous data created w from the Annual Survey of Industries (ASI) in such a way, to the point that would deal with the confound between these two arrangements of information and keep up definitional equality also. With regards to Indian assembling businesses, there are a few studies on the execution of efficiency development (Ahluwalia 1985, 1991; Goldar, Siddharthan and Lal 2003; Balakrishnan 2003). Gupta and Huefner(1972) utilizing a type of bunch examination assembled 20 enterprises as per their qualities as reflected in four select budgetary proportions. Falk and Heintz (1975) utilized certain money related proportions to build up a positioning of industry as indicated by level of danger in light of specific industry qualities. No observational study seems to have been made to survey execution of Indian assembling businesses as far as budgetary proportions and create groupings taking into account a concurrent correlation of the proportions and in this manner, the industry qualities in general. The uncertain goal of this learning is to yield up such a workout with respect to the Indian manufacturing sector.

2. THE FINANCIAL INDICATORS

The financial ratios are chosen with a perspective to having a legitimate judgment about gainfulness, liquidity, influence, obligation overhauling limit and working capital administration effectiveness of a modern area. The study pick seven proportions. These proportions are regularly utilized by monetary investigators to survey budgetary execution of an organization. ROIC is conceptualized as the arrival on contributed capital, return being measured as far as benefit after expense and bank premium paid by a mechanical unit included back. OCF/IC is conceptualized as the proportion of whatever working money is created by the unit with contributed capital – an idea that is not really dealt with in a monetary examination. The proportion is built with benefit, interest and deterioration in the Numerator. ICR decides enthusiasm overhauling limit of a unit and is pictured as enthusiasm as an extent to the aggregate return, to be specific, the whole of interest and benefit. Obligation overhauling limit of a unit is surveyed by DSCR. It is conceptualized as working income communicated as a rate of interest paid and 20% of extraordinary credit. Desirable payback period being five years, a fifth of the credit is considered. ROIC gives a general sign of the benefit of an organization. OCF/IC demonstrates whether money created from operations is satisfactory to meet different commitments of a unit. DSCR and ICR are imperative for analyzing obligation adjusting and enthusiasm overhauling limit of an organization. WCMER shows the level of effectiveness in working capital administration as it measures liquid resources in connection to the association's size. This is gotten from separating working capital by contributed capital; a higher proportion would show a superior condition winning in a unit, a low proportion may prompt the issue of accessibility of working capital at the sufficient level, notwithstanding when the firm is better put regarding accessibility of altered resources. The idea of LR is that a positive LR would show less reliance on outside credits contrasted with its shareholders reserve. It is fundamentally value obligation proportion. While beyond any doubt profitability would serve as a decent measure in

inspecting the general circumstance, a more profound investigation of the situation would require some extra instruments that would help a specialist build up a better comprehension about monetary strength of an industry bunch. These proportions are proposed with this end in perspective.

Objectives

1. The study aims to measure the performance of selected Indian manufacturing industries in terms of selected financial ratios
2. To find out the selected industry characteristics (homogeneity/heterogeneity) based on selected financial ratios.

Research Design: Descriptive Research

Population

32 industry groups in two digit code belong to state of Andhra Pradesh according to ASI reports.

Sample Selection

Out of 32 industry groups, 16 industry groups are selected based on 93.57 % value of output, 94.07 % of number of workers and 94.72 % of invested capital. Thus exclusion of balance 16 industry groups which accounts for only 6.43% value of output, 5.93% of number of workers and 5.28% of invested capital, would not affect the result of our analyses on the performance of select industries. We finally select 16 such major industry groups for performing our analysis.

Source of Data

Secondary data derived from ASI (Annual Survey of Industries) data base which provides industry level data at macro level

Period of Study

1998-99 to 2012-13 i.e., 15 years of data

Statistical Tools

Mean, Median, Standard deviation ,Coefficient of variation, Quartiles and Scatter diagram.

3. DATA ANALYSIS

Table 1 explains the grouping of 16 major Industries according to their seven financial parameters. In order to identify firm groupings of industries having similar values of a particular ratio, we perform cluster analysis. Cluster analysis classifies items into groups (clusters), such that the items within a group are sufficiently homogeneous and items in different groups are less homogeneous. There exists a variety of computation methods and homogeneity criteria. In this analysis, employed one of the non-hierarchical clustering techniques, namely K-Means Method using SPSS package. Results of cluster analysis shows the four clusters as shown in the table. Table 2 explains about findings from the analysis of Scatter diagram,

with a view to assess the consistency in performance, construct a scatter diagram with respect to the 16 major industries .with average rank score with respect to a chosen ratio into on the horizontal axis and rank in items of the measure of volatility on the vertical axis. The idea is to analyses performance of any industry group simultaneously in terms of a score on individual value of a ratio and associated dispersion of the concerned ratio.

Table 1
Clusters of Homogeneous Industries

<i>Clusters</i>	<i>Industry Groups</i>	<i>Mean of ROIC</i>	<i>Mean of OCF TO IC</i>	<i>Mean of ICR</i>	<i>Mean of LR</i>	<i>Mean of DSCR</i>	<i>Mean of WCMER</i>
Cluster 1 (Excellent Performer)	IC1, IC16, IC17, IC20, IC21, IC24, IC25, IC26, IC27, IC28, IC29, IC32	0.14	0.25	3.90	1.98	1.63	0.29
Cluster 2 (Good Performer)	IC23	0.21	0.24	11.43	192.52	5.97	0.06
Cluster 3 (Average Performer)	IC15	16.38	0.11	-1.56	1.98	1.39	0.21
Cluster 4 (Below average Performer)	IC22, IC31	0.31	0.41	8.60	1.63	1.92	0.44

Table 2
Findings from the Analysis of Scatter Diagram

<i>Chosen ratios</i>	<i>Consistently good performer (high value of mean with low value of cv)</i>	<i>Inconsistently good performer (high value of mean with high value of cv)</i>	<i>Consistently bad performer (low value of mean and low value of cv)</i>	<i>Worst performer (low value of mean with high value of cv)</i>
ROIC		IC15	IC22, IC23, IC24, IC31	IC1, IC16, IC17, IC20, IC21, IC25, IC26, IC27, IC28, IC29, IC32
OCF TO IC			IC20, IC22, IC23, IC24, IC25, IC29	IC1, IC15, IC16, IC17, IC21, IC26, IC27, IC28, IC31, IC32
ICR	IC25	IC1, IC16, IC26, IC27, IC32, IC31, IC29, IC28	IC15	IC17, IC20, IC21, IC22, IC23, IC24
DSCR	IC15, IC16, IC20, IC21, IC22, IC24, IC25, IC26, IC28, IC29, IC30	IC1, IC23, IC27, IC32	IC17	
LR		IC15, IC16, IC17, IC20, IC21, IC22, IC23, IC24, IC26, IC27, IC28, IC29, IC31, IC32	IC25	IC1
WCMER			IC1, IC15, IC16, IC17, IC20, IC24, IC25, IC28, IC31, IC32	IC21, IC22, IC23, IC26, IC27, IC29
CR		IC1, IC16, IC20, IC21, IC22, IC23, IC24, IC25, IC26, IC27, IC28, IC29, IC31, IC32		IC15, IC17

Table 3
Characteristics of Industry Groups

<i>Group</i>	<i>Industry</i>	<i>Characteristics</i>
1 (Excellent performer)	IC01-Agriculture hunting and related activities. IC16-Manufacture of Tobacco Products. IC17-Manufacture of Textiles. IC20-Manufacture of wood and products of wood and cork, except furniture, manufacture of articles of straw and plating materials. IC21-manufacture of paper and paper products. IC 24-manufacture of chemicals and chemical products. IC25-Manufacture of rubber and plastic products. IC26-Manufacture of other Non-Metallic Mineral Products. IC27-Manufacture of Basic Metals. IC28-Manufacture of Fabricated metal products, except machinery and equipment's. IC29-Manufacture of machinery and equipment. IC32-Manufacture of Radio, Television, Communication equipment and Apparatus.	<ul style="list-style-type: none"> • Efficient operating management, better liquidity position, higher capacity utilization and assets turnover giving rise to satisfactory level of profit margin. • Cash generated from operation can meet the entire interest obligation and two times loan installment obligation. • Shareholder's fund can cover more than 50% of total liabilities. • Net working capital can fund about 45% of total liabilities. • Performance is consistently good.
2 (Good performer)	IC23-Manufacturing of coke, Refined Petroleum Products and Nuclear Fuel.	<ul style="list-style-type: none"> • Satisfactory level of operating management, liquidity position, capacity utilization and assets turnover giving rise to accepted level of profit margin. • Cash generated from operation can meet entire interest obligation and almost two times loan installment obligation indicating satisfactory level of interest and debt servicing capacity. • Shareholder's fund can cover almost about 50% of total liabilities. • Net working capital can fund about 30% of total liabilities. • Performance is good but not consistent.
3 (Average performer)	IC15-Manufacturing of Food products and Beverages	<ul style="list-style-type: none"> • Inefficient operating management, sub-optimum level of capacity utilization and assets turnover giving rise to moderate level of liquidity and profit margin. • Cash generated from operation is not adequate to meet interest and loan installment obligation indicating poor debt and interest servicing capacity. • Shareholder's fund can hardly cover one third of total liabilities. • Net working capital can fund not more than one fourth of total liabilities.
4 (Worst performer)	IC22-Publishing, Printing and Reproduction of recorded media. IC31-Manufacture of Electrical machinery and apparatus.	<ul style="list-style-type: none"> • Worst operating management, capacity utilization and assets turnover giving rise to incurring such a level of loss that causes liquidity crisis, nonpayment of interest and debt obligation. • Accumulated losses exceed net worth. • Current liabilities are much less than current assets.

4. CONCLUSION AND RECOMMENDATIONS

ROIC of an Industry should be more than weighted average cost of borrowings. In case of the Industry code IC27 and IC32 the ROIC values were negative this indicates that these two industries are not profitable. Hence, it is suggested to these two companies that they have to get positive profits so that their ROIC will maximize. Annual cash generation from the business should be at least $1/3^{\text{rd}}$ of outstanding loan making DSCR of minimum 1.33. In case of IC17 and IC26, these two companies are not maintaining sufficient cash from the business. Hence, these two companies necessarily maintain a minimum of DSCR 1.33 to meet outstanding loan. IC16, IC20, IC21, IC23, IC24, IC32 Industries LR is less than 2:1 hence it is suggest to these Industries that total outstanding loan should not be more than 2times of shareholders fund making LR of 2:1. Hence, the shareholders can maximize their wealth. IC15 and IC17 these two Industries have to maintain profit should be at least 33% of interest obligation making ICR of 1.33. Net Working capital should be at least 25% of total assets making WC MER of 0.25 but in case of IC15, IC17, IC21, IC23, IC24, IC27, IC29 it is less than the required hence these Industries have optimally utilize the total assets to reduce the usage of working capital.

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