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RELATIONSHIP BETWEEN PROFITABILITY AND ADVERTISING EXPENDITURE: A STUDY OF SELECTED COMPANIES IN INDIAN MANUFACTURING SECTOR

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Abstract

The present paper attempts to analyze the growth pattern in advertising expenditure and profitability as well as the linkage between them in selected fifty companies which were selected by taking top five companies from each of the ten selected industries in the Indian manufacturing sector for the period 2002 to 2016. In this study return on capital employed (ROCE) was taken as the overall profitability measure. A recursive simultaneous equation framework as suggested by the outcome derived from the endogenity test was used in explaining the variation of ROCE as well as advertising expenditure on the basis of some identified explanatory variables. The study found that, inter-industry variation of advertisement expenditure gradually stepped up over time. The overall regression results revealed that FATR, ITR, DTR and CTR had significant positive influence on the profitability while MS and estimated ROCE significantly influenced the advertising expenditure.

Keywords: *Profitability, Advertising expenditure, Recursive model, Market share*

1. Introduction

In today's challenging and competitive environment efficient designing of advertisement policy is an integral component of the overall corporate strategy to enhance revenue generating capability. In fact, one of the significant decision areas of corporate management in which the concerned managers are actively interested is the formulation of advertising policy. Two controversial issues in the corporate management are (i) whether the advertisement policy pursued by a company has a bearing on its profitability and (ii) whether the profitability of a

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company influences its advertisement policy. On the first issue, academicians and management experts are sharply divided into two schools of thought. One school of thought considers the rise of advertising cost as relevant to the company's profitability. The academicians and management experts belonging to this school of thought argue that advertising which creates spurious product differentiation and barriers to entry facilitates the improvement in the company's profitability. The other school of thought emphasizes the informative character of advertising. The experts belonging to this school of thought opine that advertising provides more information to the customers about the prices and the quality of the products which increases the competition in the markets resulting in reduction in the size of the profit. On the second issue, the thoughts of management experts and academicians are also not similar. Some of them argue that a company's spending capacity towards advertisement largely depends on its earning capability and so the company's profitability is considered as one of the major determinants of its advertisement policy while the others opine that all products need not be advertised. Some products have good market without advertising while others have poor market with advertising. So, the advertisement policy adopted by a company is not influenced by its profitability rather it is determined by some other factors like chances for product differentiation, hidden qualities of the product, price of the product, presence of power of emotional buying motives in the minds of consumers, the company's liquidity etc. The above mentioned issues have been studied widely during the last few decades. However, the controversy on the topic has not been resolved. No definite conclusion has so far been derived from these studies. Against this backdrop, the present paper seeks to reexamine whether there is any causal relationship between advertising cost incurred by a company and its profitability.

The remainder of the paper is structured as follows. Section 2 presents a review of the related literature and identifies the research gap. Section 3 states the objectives of the study. Section 4 narrates the sources of the data used and the methodology adopted in the study. Section 5 deals with the analysis of the growth pattern of profitability and advertising expenditure. Section 6 discusses the results obtained from the study. This section is divided into two subsections. Subsection 6.1 analyzes the determinants of profitability and advertising expenditure in an interactive framework across the selected industries while subsection 6.2 discloses the regression result of recursive simultaneous equation model. Concluding observations are presented in Section 7. Finally, in Section 8, the limitations of the study are mentioned.

2. Review of the Related Literature

Sharma and Kapur (2015) in their study examined the importance of advertising on marketing of the companies as well as the relationship between advertising expenditure and sales of 106 companies in the Indian service sector for the period 2000 to 2012. In this study Augmented Dickey-Fuller test (ADF), Engle-Granger two-step cointegration, Granger causality test and the vector error correction model (VECM) were used to test the relationship. The study found that the relationship between advertising expenditure and sales varied with the size of

the company. The study also revealed that in the larger companies a bidirectional relationship between advertising and sales was observed whereas in the smaller companies a long-run increase in sales resulted in a decrease in advertising expenditure.

The study conducted by Hirschey (1978) examined whether television advertising influences firm profitability significantly. The study was conducted by using the sample developed from firm and industry data for 1982. The multiple regression results conformed to the theoretical argument specially for large consumer products oriented firms that television advertising has a significant impact on firm profitability.

Ventoura-Neokosmidi (2005) carried out a study in which the impact of market share and advertising to sales ratio on companies' profitability was investigated by using firm level cross-sectional data of the thirty six selected fast moving consumer goods companies in the year 2002. The study found that there was a notable influence of the market share and advertising to sales ratio on the profitability. On the basis of the outcome derived from the analysis of partial F- test and partial t- test, the study also concluded that the influence of advertising to sales ratio was less as compared to the market share.

Gisser (1991) in his study made an attempt to analyze the relationships among advertising, concentration and profitability by using the data taken from the 1977 Census of Manufactures and the Detailed Input-Output Structure of the U.S. Economy. The Wu-Hausman test was applied in this study for the purpose of measuring the potential simultaneity across the advertising, concentration and profitability. The study observed that the regressors were exogenous in nature. The OLS regression result revealed that the effect of advertising on profitability was significant and greater in the homogeneous subsample as compared to that in the heterogeneous subsample.

Dauda (2014) in his study examined the impact of advertising expenditure on the sales revenue and profitability of Nigerian Bottling Company during the period 1996 to 2009. Using correlation analysis and regression analysis, the study found that advertising expenditure had a significant influence on the sales revenue of the company while it failed to enhance the company's profitability during the study period.

Sharma and Sharma (2009) in their study analyzed the growth pattern and trend of advertisement expenses and sales of the 134 randomly selected companies in India during the period 1992-93 to 2006-07. Using the fixed effect regression analysis, the study found that advertising expenditure made a significant contribution towards enhancing the sales revenue of the selected companies. The study also revealed that the manufacturing companies established themselves as more efficient in making utilization of their advertisement expenses as compared to the non-manufacturing ones during the period under study.

A large number of studies were carried out on the issue associated with the interrelation between advertising cost and corporate profitability in India and abroad during the last few

decades. A considerable number of studies on this issue relating to the Indian manufacturing industry were also conducted during the post-liberalization period. The results obtained from those studies were inconclusive. However, a significant number of studies had revealed positive relationship between advertising cost and corporate profitability. Most of these studies had applied ordinary least-squares regression to estimate single-equation relationships. But this approach is highly questionable because in these cases the relationship estimated is a part of a simultaneous-equations system. Moreover, no significant study on the unresolved issue in an interactive framework of Indian manufacturing industry was made during the post-liberalization era using recursive simultaneous equation system. In order to bridge the gap the present study was conducted.

3. Objectives of the Study

The following objectives which were set in the present study are:

i) To ascertain the growth pattern of advertising expenditure and profitability of the selected industries.

ii) To examine whether any causal relationship between profitability and advertising expenditure of the selected companies exists.

4. Source of Data and Methodology of the Study

Data Source: The study was based on ten major industries in India which were selected from the manufacturing sector following purposive sampling procedure. Since each industry is composed of a number of companies, for each industry company-wise observations on profitability, advertisement expenditure and the related explanatory variables for the period 2002 to 2016 were considered. Top Five companies were selected from each of the selected industries. As the data of the selected companies for the fifteen years under study were taken, the number of observations were 75 for each of the selected industries. The ten industries and fifty companies selected for the study are listed in Appendix-I. The data of the selected companies as well as industries for the period 2002 to 2016 used in this study were taken from secondary sources, i.e. Capitaline Corporate Database. For the purpose of making empirical analysis, variables like advertising expenditure (ADD), return on capital employment (ROCE) indicating overall profitability, market share as measured by the company's sales as a percentage of the concerned industry's total sales revenue, total assets indicating availability of fund etc. were considered. The fixed assets turnover ratio (FATR), inventory turnover ratio (ITR), debtors turnover ratio (DTR) and cash turnover ratio (CTR) measuring efficiency of managing fixed assets, inventory, debtors and cash respectively were also used in this study.

Methodology of the Study: Tabular analysis was made to analyze the growth rate of the profitability and advertising expenditure of the selected companies during the study period. A recursive simultaneous equation framework was used to explain the variation of ROCE as

well as advertising expenditure across the selected Indian manufacturing industries on the basis of some identified explanatory variables. It is well accepted that ROCE is influenced by the efficiency of fixed asset management, inventory management, debtors management and cash management whereas advertising expenditure depends on overall profitability, market share of the company, availability of fund. Thus while selecting the explanatory variables, this theoretical argument was followed. Because of recursive nature of the relation, the individual regression was run with OLS technique with White's heteroscedasticity corrected standard errors (Robust Standard Errors). The detailed methodology of recursive simultaneous equation system was analyzed in the respective sub-section of the paper.

5. Analysis of Growth Pattern of Profitability and Advertising Expenditure

The results presented in Table 1 reveal that out of the ten selected industries, two industries namely Consumer Good and Electric Equipment recorded negative annul average growth rate whereas the rest of the selected industries performed well in terms of earning capability as reflected by positive annual average growth rate during the period under study. More specifically, Breweries & Distilleries industry secured the highest rank with annual average growth rate of 19.55% while Personal Care industry secured the last position with annual average growth rate of 0.80%. The negative annual average growth rate of the selected profitability measure was maximum (-33.37%) in Consumer Goods whereas it was the least (-0.01%) in Electric Equipment during the study period. It is important to note that although the annual average positive growth rate of the Personal Care industry was lower as compared to the other industries having annual average positive growth rate, the industry was able to achieve the highest level of profitability as measured by return on capital employed among all the selected industries in all the years under study.

The outcomes as derived from the Table 2 reveal that the annual average growth rate of advertising expenditure found positive in all the industries under study during the study period. Out of these industries, Sugar industry secured the highest rank with annual average growth rate of 188.33% (this is due to very small advertising expenditure at the early years) and Leather Products industry occupied the last position with annual average growth rate of 10.21%. Another significant outcome of the study is that though the annual average growth rate of the Personal Care industry was not very high, it spent consistently higher level of advertising expenditure throughout the period under study while in the Sugar industry the expenditure on advertisement was the least in most of the years under study.

It is also found from the analysis that inter-industry variation of advertisement expenditure (as represented by standard deviation) gradually stepped up over time. The possible explanation in increasing standard deviation of advertisement expenditure lies in the fact that the industries belong to the monopolistic competition market increased their advertisement expenditure to capture the market share as much as possible.

Table-1: Profitability and its Growth Rate across the Selected Industries (all figures are in %)

	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	Annual Average Growth Rate
Brewery& Distillery	9.76	7.27	6.49	6.59	15.78	17.87	20.31	11.42	11.44	15.89	20.63	15.09	13.60	8.66	25.11	**19.55%**
Ceramic & Granite	10.42	10.24	10.85	13.15	16.61	17.16	14.73	16.57	20.32	20.63	21.58	21.70	19.84	20.74	22.08	**6.08%**
Consumer Goods	9.67	11.37	11.70	12.75	15.65	20.96	16.97	18.07	14.27	12.12	8.27	4.11	-1.25	2.71	3.39	**-33.37%**
Domestic Appliances	9.25	3.82	9.13	11.15	16.58	22.90	33.52	43.33	56.34	48.48	41.01	34.40	25.57	20.07	26.48	**16.71%**
Electric Equipment	18.30	15.34	15.64	17.85	20.98	24.33	27.54	20.39	22.55	17.08	17.64	12.92	12.74	14.45	15.08	**-0.01%**
Food Processing	28.64	26.69	24.55	21.22	25.80	19.61	19.73	20.17	21.85	22.64	22.68	28.42	33.18	30.31	35.53	**2.49%**
Leather Products	13.65	12.25	13.54	14.91	13.57	16.20	15.85	17.79	22.55	22.31	22.72	21.75	23.21	21.79	19.82	**3.26%**
Personal Care	63.99	50.76	59.05	71.11	82.35	72.66	85.07	88.96	86.52	69.63	60.29	64.45	65.35	62.63	63.20	**0.80%**
Sugar	14.20	12.78	13.08	17.58	23.75	16.57	6.47	12.94	13.66	10.67	11.47	11.62	4.01	2.44	7.48	**11.81%**
Tyres	9.83	14.10	12.49	9.46	8.93	16.89	24.30	15.58	32.04	20.97	16.00	18.78	24.87	24.56	26.75	**14.58%**

Source: authors' calculation from secondary data.

Table-2: Advertising Expenditure and its Growth Rate across the Selected Industries (all figures are in %)

Industry	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	Annual Average Growth Rate (%)
Brewery& Distillery	22.11	21.77	22.71	17.61	44.93	58.53	61.33	70.42	96.12	135.93	149.11	152.97	183.34	171.08	205.39	**22.05**
Ceramic & Granite	2.97	2.64	3.02	4.44	5.90	6.55	5.69	6.21	8.54	10.21	12.32	16.56	24.21	34.02	38.56	**21.60**
Consumer Goods	7.38	10.42	10.53	10.65	13.99	30.96	37.68	34.47	40.67	42.02	44.72	31.28	54.90	53.57	39.25	**18.08**
Domestic Appliances	8.79	9.75	9.10	10.64	12.63	15.10	17.65	19.41	26.54	30.18	35.97	38.06	43.45	39.43	55.18	**14.76**
Electric Equipment	1.59	1.23	1.93	4.12	8.77	9.68	14.89	14.02	21.52	20.18	27.23	28.51	24.12	32.24	37.21	**31.41**
Food Processing	36.99	36.65	43.39	41.22	48.19	57.89	72.16	85.55	118.24	139.59	167.34	195.65	268.10	259.86	271.74	**16.02**
Leather Products	5.81	5.51	8.24	9.64	8.15	9.28	11.19	12.50	16.82	17.63	19.15	19.14	16.81	18.84	19.43	**10.21**
Personal Care	261.55	251.36	228.22	253.09	294.49	369.98	420.44	570.80	665.56	792.64	795.40	980.26	1150.11	1166.79	1320.68	**12.89**
Sugar	0.11	0.08	2.23	2.81	3.18	1.30	1.46	1.54	1.09	2.78	4.91	1.85	2.93	1.16	0.85	**188.33**
Tyres	29.43	30.68	28.58	22.32	26.63	31.06	42.63	46.15	55.21	56.01	48.68	64.11	73.96	79.42	138.25	**13.82**
SD	**79.66**	**76.37**	**68.93**	**76.56**	**8.52**	**111.2**	**125.9**	**172.6**	**200.6**	**239.8**	**240.3**	**297.6**	**349.73**	**353.85**	**399.3**	

Source: authors' calculation from secondary data.

6. Results and Discussion

Test of Endogenity was applied in ascertaining the nature of the relationship between advertising expenditure and profitability.

Table-3: Results relating to Test of Endogeneity

	Return on Capital Employed (ROCE)	Advertising Expenditure (ADD)
Breweries & Distilleries	Robust score $Chi^2(1) = 4.94586$ (p = 0.0262)	Robust score $Chi^2(1) = 0.063739$ (p = 0.8007)
	Robust regression F(1,69)= 3.43692 (p = 0.0680)	Robust regression F(1,67) = 0.060521 (p = 0.8064)
Ceramics & Granite	Robust score $Chi^2(1) = 5.64129$ (p = 0.0175)	Robust score $Chi^2(1) = 2.43871$ (p = 0.1184)
	Robust regression F(1,70) = 2.97698 (p = 0.0889)	Robust regression F(1,68) = 2.17861 (p = 0.1251)
Consumer Goods – Electronics	Robust score $Chi^2(1) = 3.70867$ (p = 0.0541)	Robust score $Chi^2(1) = 0.187212$ (p = 0.6652)
	Robust regression F(1,70) = 3.55712 (p = 0.0634)	Robust regression F(1,68) = 0.16164 (p = 0.6889)
Domestic Appliances	Robust score $Chi^2(1) = 6.23516$ (p = 0.0125)	Robust score $Chi^2(1) = 0.087145$ (p = 0.7678)
	Robust regression F(1,70) = 7.97176 (p = 0.0062)	Robust regression F(1,68) = 0.079739 (p = 0.7785)
Electric Equipment	Robust score $Chi^2(1) = 3.34124$ (p = 0.0676)	Robust score chi2(1) = 0.512339 (p = 0.4741)
	Robust regression F(1,70) = 4.04454 (p = 0.0482)	Robust regression F(1,68) = 0.463723 (p = 0.4982)
Food Processing	Robust score $Chi^2(1) = 7.62144$ (p = 0.0058)	Robust score $Chi^2(1) = 1.80748$ (p = 0.1788)
	Robust regression F(1,70) = 12.9661 (p = 0.0006)	Robust regression F(1,68) = 2.06837 (p = 0.1550)
Leather Products	Robust score $Chi^2(1) = 2.2693$ (p = 0.1320)	Robust score $Chi^2(1) = 0.911748$ (p = 0.3397)
	Robust regression F(1,70) = 2.66498 (p = 0.1071)	Robust regression F(1,68) = 0.812113 (p = 0.3707)
Personal cares	Robust score $Chi^2(1) = 10.4415$ (p = 0.0012)	Robust score chi2(1) = 0.990588 (p = 0.3196)
	Robust regression F(1,70) = 11.5582 (p = 0.0011)	Robust regression F(1,68) = 0.827798 (p = 0.3660)
Sugar	Robust score $Chi^2(1) = 3.4576$ (p = 0.0630)	Robust score $Chi^2(1) = 0.648188$ (p = 0.4208)
	Robust regression F(1,70) = 4.04768 (p = 0.0482)	Robust regression F(1,68) = 0.611086 (p = 0.4370)
Tyres	Robust score $Chi^2(1) = 6.31871$ (p = 0.0119)	Robust score $Chi^2(1) = 0.007094$ (p = 0.9329)
	Robust regression F(1,70) = 3.43918 (p = 0.0681)	Robust regression F(1,68) = 0.006451 (p = 0.9362)

Source: Authors' calculation from secondary data.

The results obtained from the endogenity test indicate that in the second structural equation ROCE was endogenous in nature. But when the variable, advertising expenditure (ADD) was included in first structural equation, it became exogenous. Hence the above regression equations were locked in a form of recursive simultaneous equation system.

6.1 Determinants of Profitability and Advertising Expenditure in an Interactive Framework

First of all the factors influencing the profitability were analyzed. Then the factors influencing the advertising expenditure was analyzed. Finally, the determinants of profitability and advertising expenditure were examined in an interactive framework.

Analysis of Profitability:

The profitability of a company largely depends on the efficiency of managing its fixed assets, inventory, debtors, cash etc. The efficiencies of management of such assets are generally measured in terms of fixed assets turnover ratio (FATR), inventory turnover ratio (ITR), debtors turnover ratio (DTR) and cash turnover ratio (CTR) respectively. There are plausible reasons as to why these variables are likely to determine the variation in profitability of the companies.

With an increase in FATR (X_1), the efficiency of the fixed assets management increases which leads to increase in the earning capability of the company. ITR analyzes the efficiency of inventory management of the company. The higher the ITR (X_2), the greater is the efficiency of managing inventory of the company and higher is the scope of generating operating surplus. DTR is an important tool of analyzing the efficiency of debtors management of the company. The higher the DTR (X_4), the shorter is the time lag between credit sales and cash collection and higher is the efficiency of management of debtors. The efficiency of managing debtors has a positive impact on the profitability of the company. The efficiency of cash management steps up with an enhancement of CTR (X_3). It results in an increase in profitability of the company. The regression equation is represented as:

$$(ROCE)_{it} = \ _0 + \ _1(FATR)_{it} + \ _2(ITR)_{it} + \ _3(CTR)_{it} + \ _4(DTR)_{it} + u_{1t}$$

where ROCE is return on capital employed, FATR is fixed asset turnover ratio, ITR is inventory turnover ratio, CTR is cash turnover ratio, and DTR is debtors turnover ratio.

In terms of notation the equation stands as:

$$(Y)_{it} = \ _0 + \ _1(X_1)_{it} + \ _2(X_2)_{it} + \ _3(X_3)_{it} + \ _4(X_4)_{it} + u_{1t} \quad \text{..... (1)}$$

Analysis of Advertising Expenditure:

It is argued that advertisement expenditure of a company is greatly influenced by the market share captured by the company. With the increase in the market share, the company's capability to exploit the market increases. As a result, the spending power of the company on

advertisement goes up. Similarly, fund availability has also a positive bearing on the company's ability to incur advertisement expenditure. The higher the availability of fund in the hands of the company, the higher is its potentiality to spend money on advertisement expenditure. Theoretically, there should be a positive influence of the estimated profitability of the company on its advertisement expenditure. In fact, the significant hike in the earning capability is recognized as an effective means to simulate the company to spend much on advertisement expenditure for generating more revenue by enhancing the market share. Thus, in the analysis of advertisement expenditure,market share of that company, availability of fund and estimated value of return on capital employed were taken as the explanatory variables.

The variables considered for explaining the advertising expenditure of a company are: market share of that company (X_5), availability of fund (X_6) as well as estimated value of return on capital employed (Y_1). The regression equation stands as:

$$(ADD)_{it} = {}_0 + {}_1(ROCE)_{it} + {}_2(MS)_{it} + {}_3(FUND)_{it} + u_{2t} \quad \text{..... (2)}$$

where ADD is advertising expenditure, MS is market share and FUND is availability of fund of a company. In terms of notation the equation stands as:

$$(Z)_{it} = {}_0 + {}_1(Y)_{it} + {}_2(X_5)_{it} + {}_3(X_6)_{it} + u_{2t}$$

6.2 The Structure and Estimation of the Recursive Simultaneous Equations Model

In more general form the two equation system may be written as:

$$(Y)_{it} = {}_0 + {}_1(X_1)_{it} + {}_2(X_2)_{it} + {}_3(X_3)_{it} + {}_4(X_4)_{it} + U_{1t} \quad \text{..... (3)}$$

$$(Z)_{it} = {}_0 + {}_1(Y)_{it} + {}_2(X_5)_{it} + {}_3(X_6)_{it} + U_{2t} \quad \text{..... (4)}$$

The two regression equations thus developed, are locked in a form of recursive simultaneous relationship which can be estimated by OLS technique.

The system comprises two endogenous variables (*ROCE*) and (*ADD*) with 6 predetermined variables viz X_1, X_2, X_3, X_4, X_5, and X_6. And u's are stochastic variables statistically independent of the Y's and X's. Moreover u_{2t} is assumed to be statistically independent of Y.

If we assume that G_1 indicates the number of included endogenous variables and G_2 stands for the number of excluded endogenous variables while K_1 stands for the number of included predetermined variables and K_2 indicates the number of excluded predetermined variables in the respective equations. In equation (3) $G_1 = 1$, $G_2 = 1$, $K_1 = 4$, $K_2 = 2$; while in case of equation (4) $G_1 = 2$, $G_2 = 0$, $K_1 = 2$, $K_2 = 4$. The identification condition of the structural equations requires that K_2 G_1-1. On this basis, both the structural equations are identified and it is possible to apply ordinary least squares method to derive consistent estimates of the structural parameters.

Table-4: Result Relating to First Structural Equation

		Constant	FATR	ITR	DTR	CTR	R-squared	F-Statistic
Breweries & Distilleries	Coefficient	6.128332*	0.009216*	0.375984*	-0.000508	2.183147*	0.547	20.858*
	Robust Std. Error	1.320572	0.001797	0.086668	0.000459	0.726311		
	t-Statistic	4.640663	5.129787	4.338223	-1.106841	3.005801		
	Prob.	0.000	0.000	0.000	0.2722	0.0037		0.000
Consumer Goods - Electronics	Coefficient	2.804482	0.918897*	0.297679	-0.008915	42.07433**	0.164	3.449*
	Robust Std. Error	2.129221	0.298613	0.407021	0.249377	17.48001		
	t-Statistic	1.317140	3.077214	0.731360	-0.035751	2.406997		
	Prob.	0.1921	0.0030	0.4670	0.9716	0.0187		0.012451
Ceramics & Granite	Coefficient	-6.848951*	5.069742*	0.324649	1.554704*	69.07357*	0.700	40.842*
	Robust Std. Error	2.147716	0.830811	0.364895	0.311450	13.17746		
	t-Statistic	-3.188945	(6.102158)	(0.889706)	(4.991826)	(5.241796)		
	Prob.	0.0021	0.000	0.367	0.000	0.000		0.000
Domestic Appliances	Coefficient	-40.79584*	1.461825*	3.183309*	3.725503*	344.0375*	0.827	83.538*
	Robust Std. Error	4.823897	0.439621	0.528390	0.490887	81.87143		
	t-Statistic	-8.457030	3.325196	6.024545	7.589332	4.202168		
	Prob.	0.0000	0.0014	0.0000	0.0000	0.000		0.000
Electric Equipment	Coefficient	6.170586**	2.210651*	0.115555	0.307857*	3.54500**	0.734	48.219*
	Robust Std. Error	2.640457	0.292960	0.433599	0.038782	1.487373		
	t-Statistic	2.336939	7.545926	0.266502	7.938202	2.383398		
	Prob.	0.0223	0.000	0.7906	0.0000	0.0199		0.000
Food Processing	Coefficient	-1.082597	3.010171*	0.7387***	0.043036	49.71094*	0.480	16.177*
	Robust Std. Error	3.626171	0.797635	0.397036	0.039383	7.284223		
	t-Statistic	-0.298551	3.773869	1.860547	1.092757	6.824466		
	Prob.	0.7662	0.0003	0.0670	0.2782	0.0000		0.000
Leather Products	Coefficient	4.29162***	-0.696744	1.284408*	0.469134*	47.98063	0.627	29.385**
	Robust Std. Error	2.426421	1.545404	0.317886	0.056940	37.15573		
	t-Statistic	1.768706	-0.450849	4.040469	8.239081	1.291339		
	Prob.	0.0813	0.6535	0.0001	0.0000	0.200		0.000
Personal Care	Coefficient	-38.55524*	12.52783*	3.369618*	0.473405*	0.323624	0.659	33.829*
	Robust Std. Error	12.34545	2.115367	0.868650	0.147022	36.93774		
	t-Statistic	-3.123032	5.922296	3.879145	3.219955	0.008761		
	Prob.	0.0026	0.0000	0.0002	0.0019	0.9930		0.000
Sugar	Coefficient	6.139206**	3.253810**	0.151838	0.021861	-5.766070	0.166	3.479**
	Robust Std. Error	2.753381	1.546952	0.195524	0.059180	4.353317		
	t-Statistic	2.229697	2.103369	0.776573	0.369393	-1.324524		
	Prob.	0.0290	0.0390	0.4400	0.7129	0.1896		0.0119
Tyres	Coefficient	-9.845964**	3.08556***	1.858666*	0.21135**	-11.95251	0.511	18.266*
	Robust Std. Error	4.313141	1.849196	0.516441	0.082958	26.38539		
	t-Statistic	-2.282783	1.668598	3.598988	2.547725	-0.452997		
	Prob.	0.0255	0.0997	0.0006	0.0130	0.6520		0.000

Source: Authors' calculation from secondary data.

* indicate 1% level of significance.

** indicate 5% level of significance.

*** indicate 10% level of significance.

The regression result obtained from the first structural equation reveals that explanatory variables were significant in majority of the cases. Therewere differences in the level of significance as well as level of impact of individual explanatory variables on the profitability of industry as measured in terms of ROCE. In the Breweries & Distilleries industry, variables namely FATR,

ITR and CTR had significant positive impact on ROCE. For one unit increase in FATR, the earning capability of the company increased by an amount of 0.009216 indicating negligible impact on profitability. The regression coefficient value associated with ITR implies that when ITR increased by one unit, it had an impact of 0.38 on the value of ROCE. With one unit increase in CTR, there was a positive impact on the value of profitability by 2.18. All these outcomes conform to the theoretical argument that the higher the efficiency of asset management the higher is the profitability.

The variables like FATR and CTR had significant positive impact on ROCE in the Consumer Goods-Electronics sector. For one unit increase in FATR, the earning capability of the company increased by an amount of 0.92. The coefficient value associated with CTR reflects that when CTR increased by one unit, it had an impact of 42.07 on the value of profitability. Though R^2 value was not very high, it is observed that the regression equation was good fit as indicated by the value of F-statistic and its level of significance.

In the Ceramics & Granite industry except ITR all other explanatory variables were found to be statistically significant at different levels. It is observed from the results that with one unit increase in FATR, the profitability of the selected companies under the industry increase by 5.07 units. The regression coefficient value associated with DTR implies that for one unit increase in DTR, it had an impact of 1.56 on the value of profitability. For one unit increase in CTR, the earning capability of the company stepped up by 69.07 units.

In the industry producing Domestic Appliances, all the explanatory variables had positive impact on the profitability of the selected companies at 1 percent level of significance. In this case the value of R^2 was also very high (0.83) which was found to be statistically significant. For one unit increase in FATR, the profitability of the selected companies increased by 1.46 units. The coefficient values associated with ITR and DTR indicate that for one unit increase in ITR and DTR, the values of ROCE increased by 3.18 units and 3.72 units respectively. For one unit increase in CTR, the profitability of the selected companies stepped up by 344.04 units.

In Electric Equipment industry most of the regression coefficients showed the expected signs and were significantly different from zero. The estimated coefficients associated with FATR and CTR exceeded value 2.0 by a significant amount.

In case of Food Processing industry except DTR all other explanatory variables were found to be statistically significant at different levels. The regression results reveal that with one unit increase in FATR, the profitability of the companies increased by 3.01 units. The regression coefficient value associated with ITR implies that for one unit increase in ITR, it had an impact of 0.74 on the value of profitability. For one unit increase in CTR, the earning capability of the company stepped up by 49.72 units. The variables like ITR and DTR had significant positive influence on profitability of the companies belongs to Leather Products Industry. For one unit

increase in ITR, the earning capability of the company increased by an amount of 1.28. The coefficient value associated with DTR reflects that it had an impact of 0.47 on the value of profitability when DTR increased by a one unit. In this case the value of R^2 was also high (0.63) which was found to be statistically significant.

In the Personal Care industry, FATR, ITR and DTR had positive impact on the profitability of the selected companies at 1 per cent level of significance. For one unit increase in FATR, ITR and DTR, the profitability of the companies increased by the amount of 12.53 units, 3.37units and 0.47 units respectively. In this case the value of R^2 was also high (0.66) which was found to be statistically significant.

In the sugar industry only, FATR had a positive impact on ROCE at 10 percent level of significance. Though R^2 value was not very high (0.17), the regression equation was good fit as indicated by the value of F-statistic and its level of significance.

In case of Tyres industry except CTR all other explanatory variables were found to be statistically significant at different levels. The regression results reveal that with one unit increase in FATR, the profitability of the companies increased by 3.09 units. The coefficient values associated with ITR and DTR indicate that for one unit increase in ITR and DTR, the values of ROCE increased by 1.86 units and 0.211 units respectively.

On the basis of above regression results it can be concluded that the influence of CTR of the selected industries was strong enough on their profitability as compared to the other influencing factors during the period under study.

The regression results as shown in Table 5 derived on the basis of second structural equation facilitate the testing of the hypothesized signs of the explanatory variables and level of impact of individual variables on the advertising expenditure. The variable MS had, as expected, a significant positive impact on advertising expenditure in the industries producing Breweries & Distilleries, Consumer Goods-Electronics, Electric Equipment, Personal Care products and Tyres. Again FUND had also a notable direct influence on the advertising expenditure in the industries, namely Breweries & Distilleries, Consumer Goods-Electronics, Ceramics & Granite, Domestic Appliances, Electric Equipment, Food Processing, Personal Care and Tyres. The coefficient of the ROCE, as expected, had a significant direct influence on the advertising expenditure in all the selected industries except two, namely Breweries & Distilleries industry and Sugar industry.

The regression results as disclosed in Table 6 which were derived on the basis of OLS with Robust Standard Errors facilitated the testing of the hypothesized signs of the explanatory variables and their significance as well as overall significance when year wise data across the companies for the selected industries were combined together. Although R^2 value was not very high, it is observed that the regression equation was good fit as indicated by the value of F-statistic and its level of significance. This is in conformity with the arguments of Pindyck and

Table-5: Result Relating to Second Structural Equation

Industry		Constant	MS	FUND	ROCE	R-squared	F-Statistic
Breweries & Distilleries	Coefficient	-10.21720*	0.812439*	0.077641*	0.023776	0.914	246.553*
	Robust Std. Error	1.760715	0.234285	0.009144	0.075914		
	t-Statistic	-5.802870	3.467744	8.491128	0.313198		
	Prob.	0.0000	0.0009	0.0000	0.7551		0.000
Consumer Goods - Electronics	Coefficient	12.38256**	0.726685*	0.004046*	0.75324**	0.869	156.377*
	Robust Std. Error	4.938951	0.091734	0.000689	0.338389		
	t-Statistic	2.507123	7.921629	5.870385	2.225985		
	Prob.	0.0145	0.0000	0.000	0.0292		0.000
Ceramics & Granite	Coefficient	-14.98914*	0.250604	0.016930*	0.961265*	0.6713	48.329*
	Robust Std. Error	3.460526	0.175892	0.005349	0.154891		
	t-Statistic	-4.331464	1.424756	3.165174	6.206064		
	Prob.	0.0000	0.1586	0.0023	0.000		0.000
Domestic Appliances	Coefficient	1.198227	-0.024546	0.068889*	0.231004*	0.627	39.783*
	Robust Std. Error	2.452664	0.107290	0.011509	0.062815		
	t-Statistic	0.488541	-0.228784	5.985900	3.677531		
	Prob.	0.6267	0.8197	0.0000	0.0005		0.000
Electric Equipment	Coefficient	-29.62229*	0.495111*	0.034140*	1.045806*	0.795	91.526*
	Robust Std. Error	4.892995	0.136719	0.007146	0.211387		
	t-Statistic	-6.054021	3.621374	4.777547	4.947363		
	Prob.	0.0000	0.0005	0.0000	0.000		0.000
Food Processing	Coefficient	-254.4020*	0.923096	0.125543*	10.70528*	0.724	62.152*
	Robust Std. Error	35.56366	0.947171	0.027537	1.563565		
	t-Statistic	-7.153426	0.974582	4.558991	6.846710		
	Prob.	0.0000	0.3331	0.0000	0.0000		0.000
Leather Products	Coefficient	-6.169905**	0.031121	0.010408	0.857173*	0.280	9.228*
	Robust Std. Error	3.150747	0.077640	0.009771	0.255081		
	t-Statistic	-1.958235	0.400833	1.065292	3.360393		
	Prob.	0.0541	0.6897	0.2904	0.0013		0.000
Personal Care	Coefficient	-435.1662*	12.28114**	0.379553*	4.761767*	0.709	57.739*
	Robust Std. Error	143.2892	5.598148	0.092614	1.521421		
	t-Statistic	-3.036979	2.193787	4.098231	3.129816		
	Prob.	0.0033	0.0315	0.0001	0.0025		0.000
Sugar	Coefficient	1.402957	0.038724	0.000265	-0.056024	0.329	8.188*
	Robust Std. Error	1.195934	0.049551	0.000459	0.083397		
	t-Statistic	1.173105	0.781503	0.576907	-0.671773		
	Prob.	0.2447	0.4371	0.5658	0.5039		0.000
Tyres	Coefficient	-33.85717**	1.296913*	0.020556*	0.98229**	0.738	66.857*
	Robust Std. Error	17.53062	0.473919	0.004026	0.455649		
	t-Statistic	-1.931316	2.736568	5.105480	2.155822		
	Prob.	0.0574	0.0078	0.0000	0.0345		0.000

Source: Authors' calculation from secondary data.

* indicate 1% level of significance.

** indicate 5% level of significance.

*** indicate 10% level of significance.

Table-6: Regression result of Whole Industry

First Structural Equation					Second Structural Equation				
Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**	**Variable**	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
FATR	0.007461*	0.002326	3.208042	0.0014	MS	5.6624*	1.176829	4.81156	0.000
ITR	0.422919*	0.070525	5.996696	0.0000	FUND	0.00658	0.006821	0.96517	0.334
DTR	0.001446*	0.000626	2.311285	0.0211	EST ROCE	3.2637*	1.057381	3.08655	0.002
CTR	0.104341*	0.055979	1.863914	0.0627	C	-90.024*	26.84199	-3.35385	0.000
C	13.16118*	1.218661	10.79971	0.0000					
R-squared	0.22				R-squared	0.13			
F-Statistic	42.26			0.000	F-Statistic	35.34			0.000

Source: Authors' calculation from secondary data.
* indicate 1% level of significance

Rubinfeld (1998) in which they opine that in case of cross section data, the model is good fit even if the value of R^2 is low because of wide variability of cross section observations.

The overall regression results of first structural equation reveal that all the explanatory variables selected in this study had positive influence on the profitability of the industry and was found to be significant at 1 per cent level. However, it is observed from the second structural equation that MS, FUND and EST ROCE had positive signs while out of these variables only MS and EST ROCE were found to be significant at 1 per cent level.

7. Conclusion

The study examined the industry specific growth pattern of profitability measured in terms of ROCE as well as the advertising expenditure of the fifty selected companies during the period 2002 to 2016. It also investigated the causal relationship between profitability and advertising expenditure in an interactive framework.

The study revealed a wide variation in annual average growth rate of profitability as well as the advertising expenditure across the selected industries in India during the study period. Although the Personal Care industry achieved the highest level of profitability, the annual average growth rate of profitability was lower as compared to the other selected industries. The study also revealed that though the annual average growth rate of the Personal Care industry was not very high, the industry spent consistently higher level of advertising expenditure during all the years under study. In sugar industry the expenditure on advertisement was the least in most of the years under study. Further, the study found that inter-industry variation of advertisement expenditure (as represented by standard deviation) gradually stepped up over time.

The industry specific results obtained from the recursive simultaneous equation analysis revealed that the efficiency of managing fixed assets, inventory, cash and debtors as indicated by the explanatory variables FATR, ITR, CTR and DTR respectively had significant direct influence

on the overall profitability in majority of the selected industries during the study period. The study also observed that in most of the selected industries explanatory variables like market share, availability of fund and estimated value of ROCE had positive influences on the advertising expenditure which were found to be statistically significant. These outcomes conform to the concerned theoretical arguments.

The overall regression results revealed that the efficiency of managing fixed assets, inventory, cash and debtors had positive effects on the overall profitability of the selected industries and were found to be significant at 1 per cent level. The study also concluded that the explanatory variables, namely market share and estimated value of return on capital employed had significant direct influences on the advertising expenditure.

8. Limitations of the Study

i) In the present study, only four selected company-specific factors, such as FATR, ITR, CTR and DTR were considered as the determinants of profitability and three variables, namely, profitability, market share and availability of fund were taken as the determinants of advertisement expenditure. However, economy-specific and industry-specific factors influencing profitability and advertisement expenditure were not considered in the study.

ii) While choosing the industries in the Indian manufacturing sector, purposive sampling procedure was adopted.

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Appendix-I
List of Selected Industries as well as Companies

Industry	Company
Breweries & Distilleries	United Spirits, GM Breweries, Pincon Spirit, Khoday India, Pioneer Distill.
Consumer Goods - Electronics	Videocon Ind, Mirc Electronic, Salora Inter, Choksi Imaging, Photoquip India
Ceramics & Granite	Kajaria Ceramic, Cera Sanitary, Somany Ceramics, HSIL, Orient Bell
Domestic Appliances	Bajaj Electricals Ltd, Hawkins Cooker Ltd, Butterfly, Khaitan Electricals Ltd, TTK Prestige Ltd.
Electric Equipment	Havells India, Honda Siel, HBL Power, Swelect Energy, Salzer Electro.
Food Processing	Britannia, Glaxo Smith Con, KRBL, Heritage Foods, ADF.
Leather Products	Bata India, Relaxo Footwear, Mirza Intl, Liberty Shoes, Superhouse.
Personal Care	Hindustan Unilever, Godrej Consumer, Dabur India, Colgate, Gillette India,
Sugar	EID Parry, Balrampur Chini, Andhra Sugar, Uttam Sugar, KCP Sugar,
Tyres	Apollo Tyres Ltd, MRF Ltd, Ceat Ltd, JK Tyre & Industries Ltd, Goodyear India Ltd.