



GLOBAL JOURNAL OF MANAGEMENT AND BUSINESS RESEARCH: E  
MARKETING

Volume 16 Issue 2 Version 1.0 Year 2016

Type: Double Blind Peer Reviewed International Research Journal

Publisher: Global Journals Inc. (USA)

Online ISSN: 2249-4588 & Print ISSN: 0975-5853

# Is Advertisement a Valid Tool to Increase Sales: A Study of Indian Manufacturing Companies

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*GJMBR - E Classification : JEL Code : M37*



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# Is Advertisement a Valid Tool to Increase Sales: A Study of Indian Manufacturing Companies

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**Abstract-** The paper studies the inter-relationship between advertisement expenditure, sales and profit. Taking ten-year data (2005-06 to 2014-15) of twenty manufacturing companies indexed in NSE's NIFTY, the study applied various models including descriptive study, correlation and regression. The tools used (Regression and Correlation) clearly show that there is a significant relationship between advertisement expenditure, sales and profit. The study concludes that there is a one-sided relationship between advertisements, sales and profit wherein advertisement expenditure positively impacts the sales and profit of the business in case of Indian manufacturing companies.

## I. INTRODUCTION

The ongoing debate over the competitive effects of advertising is implicitly contesting the issue of economic durability of advertising expenditure (e.g. Ayanian 1975; Comanor and Wilson 1974; Telser 1968, etc. Advertising plays multiple roles in that it is not only used by companies to create awareness among customers for their products and services, but also acts as a tool to build a strong brand image by dramatizing and presenting their products and services in such a way so as to attract customers' attention. The power of advertising in building strong brands has been proposed by both marketing practitioners (e.g. Martin 1989) and academics (e.g. Aaker 1991, 1996).

Though advertising is one of the most potent and effective marketing tools available to marketers for informing and persuading buyers, the efficiency and effectiveness of advertisement spending is of considerable interest both to academicians and practitioners (Xueming and Donthu, 2002).

In general, sales or market response research has made it more difficult to answer a long-standing question: "Is advertising an investment or an expense?" (Mergy and Lade 2001). Many academic researchers have argued that advertising should be treated as an investment because of its role in improving the long-term market performance of a firm (Chauvin and Hirschey 1993; Dean 1966; Dekimpe and Hanssens 1995; Graham and Frankenberger 2000; Hirschey and Weygandt 1985; Hula 1988).

Further, the firms that allocate large amounts of their resources to value advertising expect their expenditures to contribute, ultimately, to the financial

performance of the firm. Several studies have focused on the relationship between advertising expenditures and financial performance measures such as stock returns and ROI on advertising, while mainstream advertising effectiveness research in marketing has probed the relationship between advertising and market performance measures in relatively shorter time periods (Hanssens, Parsons, and Shultz, 1990).

There is a strong reason behind companies adopting advertising expenditures to escalate their sales and market share assuming a direct relationship between the two. Companies with a higher amount of sales revenue can afford to spend more on advertisements when compared to the ones with lower sales revenue. Therefore, it can be assumed that the businesses with higher sales in period 1 lead to higher advertising spending in period 2. While some of the researches reveal the presence of long-term equilibrium relationship between advertising and consumption (Guo, 2003 and Phillip, 2007), some others view that advertising expenditure causes sales but sales do not simultaneously cause advertising (Leach and Reekie, 1996).

The present study attempts to establish the linkages between advertisement spending, sales and profit in the case of Indian manufacturing companies.

The study is organized as follows. The present section introduces the concept of the study and outlines the need for it; the second section presents the objectives of the study; the third section reviews the literature available; the fourth section describes the methodology for the research; the fifth section presents the results of the study and the sixth section concludes.

## II. OBJECTIVES OF THE STUDY

The study aims to achieve the following objectives:

- To understand the change patterns in the advertisement, sales and profit in Indian manufacturing companies;
- To study the inter-relationship between advertisement, sales and profit;
- To draw policy implications for marketers as to whether increase in advertisements leads to increase in sales.

### III. REVIEW OF LITERATURE

In the past, researchers have attempted to explain some of the confusion regarding the impact and effectiveness of marketing communications, most often focusing on advertising and promotional expenditures. Farris and Buzzell (1979) explained in their study how and why differences in marketing communication intensity (as measured by advertising and promotion expenditures to sales) were related to some basic variables. Therefore, an attempt was made to identify the factors that empirically explain the variations in advertising and promotion to sales. Their study indicated that advertising and promotional expenditures expressed as a proportion of sales vary across industries, across firms within an industry and across time for a given firm.

Balasubramanian and Kumar (1990) also confirmed the same finding. Zinkhan and Cheng (1992) again used the ratio of advertising and promotional expenditures to sales as a proxy for marketing communication intensity. They investigated the variation of communication intensity due to the type of offering (product or service) and the type of market (consumer or manufacturing). They found that, both, the type of offering and the type of market affect the variation of communication intensity. Their results indicated that consumer product firms spend more on advertising than manufacturing product firms.

Simultaneously though, under pressure to produce immediate profits, managers still tend to view advertising as an expense and reduce advertising budgets in times of downturn, even though they recognize that advertising can be treated as an investment (Dean 1966; Hirschey and Weygandt 1985).

Even though this research stream has shed some light on how advertising works or should work, its contributions to our understanding of the role of advertising in a competitive, complicated, and ever-changing market environment have been limited. For example, a group of marketing researchers in this area (Bass and Leone 1983; Clarke 1976; Srinivasan and Weir 1988) who employed market-level data to explore the long-term carryover effects of advertising found that the duration of advertising effects depended on the data interval under study. Clarke (1976) and Assmus, Farley, and Lehmann (1984) suggested that 90 percent of advertising effects dissipate after three to fifteen months. Leone (1995) argued that the range of advertising effects should be narrowed to six to nine months based on his study. However, Dekimpe and Hanssens (1995) concluded that the effects of advertising did not disperse within a year. These contradictory findings could be partially attributed to the different sources of data used in the studies (Vakratsas and Ambler 1999).

Empirical researches used different tools to analyze the data about relationship between advertising and sales. Guo (2003) and Leong et al. (1996) applied the cointegration to analyse and evaluate the data. Taylor and Weiserbs (1972) put to use the Houtakker-Taylor model in their research for evaluation purpose. Leach and Reekie (1996) applied the variants of the Koyack Distributed Lag model and Granger's Causality model. Naik and Raman (2003), Pagan et al (2001) used regression analysis and OLS model. Philip (2007) used Dickey-Fuller test, Philips-Peron Test, Cointegration technique and Error Correction Models to examine association between advertising and consumption. In addition to applying the cointegration model, Guo (2003) implemented the unit root test for evaluation. Metwally (1997) implemented the correlation test for the evaluation of the data. Telser (1964), Rundfelt (1973) utilized the correlation test to examine the data.

Leach and Reekie (1996) concluded that advertising expenditure causes sales but sales do not simultaneously cause advertising. Another point to note is that marketing is defined widely in the literature. As outlined by Webster (1992) there are four different aspects of marketing practice:

(1) transactional marketing involves managing the marketing mix to attract and satisfy customers; (2) database marketing uses technology to target and retain customers; (3) interaction marketing involves developing interpersonal relationships between buyers and sellers; and (4) network marketing develops interfirm relationships for mutual benefit. This thesis specially focuses on the relationship between MC (which comes under transactional marketing) and shareholder value.

### IV. RESEARCH METHODOLOGY

In the present study the inter-relationship between advertisement, sales and profit has been studied. The study focuses on the manufacturing sector. The impact of advertisement on sales can be calculated for such companies because unlike the services sector, the sales in units are available for manufacturing companies. Hence, in order to establish the relationship between advertisement and sales, the study selects the sample from manufacturing companies. The paper draws its sample from the NSE's NIFTY index. Twenty manufacturing companies indexed in NIFTY are used as sample for the study. These include Tata Motors, Maruti Suzuki, Reliance, ONGC, Hindustan Uniliver, ITC, Cipla, Sunpharma, Mahindra & Mahindra, Hero Motors, Dr. Reddy, Tata Steel, BHEL, NHPC, Coal India, Lupin, Gail, Bajaj, Asian paints and L&T. These companies are among the most renowned in their respective industries.

The sample period for the study is ten years ranging from 2005-06 to 2014-15. To analyse the cause and effect relationship between sales and

advertisement, the ten years data of profit, net sales and selling expenses are taken. The study uses descriptive statistics, correlation and regression for analysing the data.

Following tools are used for data analysis.

$$\text{Mean} = \frac{\sum X_i}{n} \quad (1.1)$$

Usually we are interested in statistics (such as the mean) from our sample only to the extent to which they can infer information about the population. The confidence intervals for the mean give us a range of

The *mean* is a particularly informative measure of the "central tendency" of the variable if it is reported along with its confidence intervals.

values around the mean where we expect the "true" (population) mean is located (with a given level of certainty).

$$s = \sqrt{\frac{\sum (x_i - \mu)^2}{N}} \quad (1.2)$$

where

$\mu$  is the population mean and N is the population size

$$s = [S (x_i - m)^2 / N]^{1/2} \quad (0.1)$$

The sample estimate of the population *standard deviation* is computed as:

$$s = \sqrt{\frac{\sum (x_i - \bar{x})^2}{(n-1)}} \quad (0.2)$$

where

$\bar{x}$  is the sample mean and n is the sample size

The *variance* of a population of values is the square of standard deviation.

*Skewness* measures the deviation of the distribution from symmetry. If the skewness is clearly different from 0, then that distribution is asymmetrical, while normal distributions are perfectly symmetrical.

$$\text{Skewness} = \frac{nM_3}{(n-1)(n-2)s^3} \quad (1.5)$$

where

$$M_3 \text{ is equal to: } \sum_{i=1}^m (x_i - \bar{x})^3$$

$s^3$  is the sample standard deviation raised to the third power

n is the valid number of cases.

A line in a two-dimensional or two-variable space is defined by the equation  $Y=a+bX$ ; in full text, the Y variable can be expressed in terms of a constant (a) and a slope (b) times the X variable. The constant is also referred to as the intercept, and the slope as the

regression coefficient or *B* coefficient. Multiple regression procedures will estimate a linear equation of the form:

$$Y=a+b_1X_1+b_2X_2+\dots+b_pX_p \quad (1.6)$$

The regression line expresses the best prediction of the dependent variable (Y), given the independent variables (X). However, nature is rarely (if ever) perfectly predictable, and usually there is

substantial variation of the observed points around the fitted regression line.

## V. FINDINGS AND DISCUSSION

The paper presents the analysis in three parts as discussed in the methodology section above. These include descriptive statistics, correlation and regression. The descriptive statistics present an insight into the variables of advertisement expenses, sales, and profits of the twenty companies under reference. Correlation presents the coefficient of correlation between sales-

advertisement expenses, sales-profit and advertisement expenses-profit. The regression part is further divided into two sub-parts. One, sales are regressed by taking advertisement expenses as the independent variable. Two, profit is regressed by taking advertisement expenses and sales as two independent variables.

*Table 1 : Descriptive Statistics*

Name of Company		Mean	Skewness	Standard Deviation	Variance
Maruti	Sales	30516.327	0.040349	12254.91892	150183038
	Advertisement	3780.125	0.036389	1917.558959	3677032.36
	Profit	2101.73	0.802606	787.6397806	620376.424
Reliance	Sales	233563.2	0.118975	112195.9084	1.2588E+10
	Advertisement	17525.4	0.481937	6449.962088	41602010.9
	Profit	17734	-0.96721	4675.224487	21857724
Sun Pharma	Sales	2920.756	2.571337	1795.802264	3224905.77
	Advertisement	1146.736	1.969903	938.3537108	880507.687
	Profit	692.324	-1.44859	907.6478216	823824.568
Tata Motors	Sales	36185.68	0.640678	9766.769921	95389794.7
	Advertisement	7053.497	-0.51568	2331.922444	5437862.29
	Profit	766.403	-2.56461	2047.994442	4194281.23
Tata steel	Sales	28905.672	0.239514	9145.744174	83644636.5
	Advertisement	8575.945	0.678051	2833.699002	8029850.03
	Profit	5414.049	-0.17665	1139.706456	1298930.81
Coal India	Sales	338.489	0.125146	60.71547752	3686.36921
	Advertisement	212.934	1.217516	71.58499054	5124.41087
	Profit	9139.725	1.629076	7993.903869	63902499.1
Gail	Sales	33146.544	0.438787	16336.15016	266869802
	Advertisement	8863.257	0.438123	5642.241033	31834883.9
	Profit	3155.343	0.157822	748.3660618	560051.762
ONGC	Sales	68072.225	-0.04023	12126.31876	147047607
	Advertisement	32979.851	0.366099	10616.018	112699838
	Profit	18417.509	0.966152	3345.946115	11195355.4
NTPC	Sales	54067.20556	-0.13621	16302.6911	265777737
	Advertisement	2988.274444	0.527008	1166.507658	1360740.12
	Profit	9268.923333	0.325871	2015.608234	4062676.55
Asian Paints	Sales	6290.57	0.366324	3234.685093	10463187.7
	Advertisement	1329.772	0.627092	705.1993503	497306.124
	Profit	725.204	0.028536	404.5734782	163679.699
Bhel	Sales	32156.539	-0.07573	11614.9505	134907075
	Advertisement	3907.817	-0.02245	1865.624005	3480552.93
	Profit	3894.801	0.497653	2027.669929	4111445.34
Cipla	Sales	6156.864	0.284038	2232.297961	4983154.18
	Advertisement	1768.381	-0.47628	625.6184556	391398.452
	Profit	998.588	0.284401	312.0602748	97381.6151

Dr. Reddy	Sales	5767.676	0.47657	2719.915817	7397942.05
	Advertisement	568.899	0.785086	265.008241	70229.3678
	Profit	995.35	0.41922	534.0144225	285171.403
Hero Motors	Sales	17884.872	0.113974	6659.631185	44350687.5
	Advertisement	1853.162	0.500902	680.6017945	463218.803
	Profit	1722.961	-0.42363	628.2864936	394743.918
HUL	Sales	18673.511	0.300382	7017.891662	49250803.4
	Advertisement	2304.829	-0.01061	1108.202714	1228113.26
	Profit	2550.47	0.515596	1093.285392	1195272.95
ITC	Sales	21460.969	0.408185	9074.773995	82351523.1
	Advertisement	4664.019	-0.82492	1508.525663	2275649.68
	Profit	5234.132	0.588564	2636.811471	6952774.73
L&T	Sales	39944.951	-0.25324	16919.77178	286278677
	Advertisement	1746.431	-0.34153	345.7954262	119574.477
	Profit	3632.011	-0.69571	1579.308635	2494215.77
LUPIN	Sales	4819.901	0.69332	2810.33817	7898000.63
	Advertisement	1497.603	0.092359	587.2881236	344907.34
	Profit	959.041	1.21064	799.974896	639959.834
M&M	Sales	23705.373	0.284919	12682.10094	160835684
	Advertisement	2809.069	-0.07641	1242.872309	1544731.58
	Profit	2192.666	-0.03004	1147.253448	1316190.47
Bajaj	Sales	14478.803	0.079178	5051.197622	25514597.4
	Advertisement	1241.55	1.022556	268.5360103	72111.5888
	Profit	2036.726	-0.12005	1151.401047	1325724.37

Table 1 presents the descriptive statistics about sales, advertisement expenses and profit of 20 sample companies for the sample period of ten years. The table presents mean score, skewness, standard deviation and variance for the sample. Basic insights about the data are available in the table. The maximum mean sales of

Rs 2,33,563 crore are observed in the case of Reliance Industries. The maximum mean advertisement expenditure of Rs 32,980 crore, however, is incurred by ONGC. ONGC also reported the maximum mean score in respect of profit, amounting to Rs 18,417 crore.

*Table 2* : presents the correlation coefficients between the variables under study.

	Sales-Advertisement Expenses		Sales-Profit		Advertisement Expenses-Profit	
	Coefficient of Correlation	Sig (2-tailed)	Coefficient of Correlation	Sig (2-tailed)	Coefficient of Correlation	Sig (2-tailed)
Maruti	.969**	.000	.856**	.002	.841**	.002
Reliance	.884**	.001	.844**	.002	.877**	.001
Sun Pharma	.965**	.000	-.744*	.014	-.653*	.041
Tata Motors	.586	.075	-.042	.908	-.245	.494
Tata steel	.977**	.000	.755*	.012	.658*	.039
Coal India	.241	.502	-.205	.569	.235	.513
GAIL	-.666*	.036	.807**	.005	-.622	.055
ONGC	.960**	.000	.754*	.012	.645*	.044
NTPC	.891**	.001	.900**	.000	.821**	.004
Asian Paints	.993**	.000	.979**	.000	.966**	.000
Bhel	.850**	.002	.878**	.001	.563	.090
Cipla	.868**	.001	.887**	.001	.728*	.017



Dr. Reddy	.982**	.000	.902**	.000	.848**	.002
Hero Motors	.952**	.000	.894**	.000	.850**	.002
HUL	.987**	.000	.981**	.000	.951**	.000
ITC	.905**	.000	.996**	.000	.874**	.001
L&T	.867**	.001	.952**	.000	.763*	.010
Lupin	.973**	.000	.974**	.000	.928**	.000
M&M	.863**	.001	.972**	.000	.908**	.000
Bajaj	.947**	.000	.928**	.000	.939**	.000

In table 2, the cases where correlation is significant are marked with \*\*. The table shows that the correlation between sales and advertisement expenses is significant (at 95% level of confidence) in the case of all companies except for Tata Motors and Coal India. Correlation between sales and advertisement expenses is positive in most of the cases with the exception of GAIL where coefficient of correlation is observed to be -0.666. Correlation between sales and profit is also significant in all the companies except for Tata Motors and Coal India. The correlation between sales and profit is positive in most of the cases with the exception of Sunpharma, Tata Motors, Coal India where coefficient of

correlation is observed to be -.744, -.042, -.205. Further, correlation between advertisement expenses and profit is not significant in the case of Tata Motors, Coal India and BHEL, while it is significant in all other cases. The correlation is observed to be positive in most of the cases with the exception of Sunpharma, Tata Motors, GAIL where coefficient of correlation is observed to be -.653, -.245, -.622. Since the correlation between the variables under reference is observed to be significant as well as positive in most of the companies, it makes a case for building a regression model between the variables.

*Table 1.3 : Regression – Sales on advertisement expenses*

	Sales-Advertisement Expenses		
	R Square	Sig	Beta
Maruti	.944	0.000	.001
Reliance	.803	0.003	.118
Sun Pharma	.953	0.000	.000
Tata Motors	.355	0.216	.091
Tata steel	.976	0.000	.000
Coal India	.131	0.613	.426
Gail	.695	0.016	.349
ONGC	.953	0.000	.000
NTPC	.882	0.001	.080
Asian Paints	.986	0.000	.000
Bhel	.956	0.000	.521
Cipla	.892	0.000	.035
Dr. Reddy	.981	0.000	.000
Hero Motors	.932	0.000	.008
HUL	.992	0.000	.001
ITC	.998	0.000	.006
L&T	.954	0.000	.031
Lupin	.983	0.000	.007
M&M	.947	0.000	.614
Bajaj	.90	0.000	.026

The table exhibits that the coefficient of determination in case of all companies except Coal India and Tata Motors is close to 1. This implies that the model of regressing sales on advertisement expenses is a suitable one. This point is also justified by the

significance value, which is observed to be less than 0.05 in all the companies except Tata Motors and Coal India. The table also presents the beta values on the basis of which regression equation can be built.

Table 1.4 : Regression – Profit on sales, advertisement expenses

	Profit-Sales, Advertisement Expenses			
	R Square	Sig	Beta - Advertisement Exp	Beta - Sales
Maruti	.735	0.010	.807	.425
Reliance	.791	0.004	.151	.422
Sun Pharma	.613	0.036	.330	.108
Tata Motors	.076	0.758	.477	.739
Tata steel	.705	0.014	.116	.039
Coal India	.128	0.619	.434	.469
Gail	.663	0.022	.620	.047
ONGC	.649	0.026	.247	.068
NTPC	.813	0.003	.809	.057
Asian Paints	.962	0.000	.000	.000
Bhel	.891	0.000	-.658	1.437
Cipla	.793	0.004	.637	.020
Dr. Reddy	.854	0.001	.209	.038
Hero Motors	.799	0.004	.987	.147
HUL	.971	0.000	.165	.005
ITC	.997	0.000	.015	.000
L&T	.922	0.000	.271	.001
LUPIN	.955	0.000	.330	.007
M&M	.963	0.000	.101	.001
Bajaj	.864	0.000	.012	.000

The table exhibits that the coefficient of determination in case of all companies except Coal India and SunPharma is close to 1. This implies that the model of regressing Profit on advertisement expenses and sales is a suitable one. This point is also justified by the significance value, which is observed to be less than 0.05 in all the companies except Tata Motors and Coal India. The table also presents the beta values on the basis of which regression equation can be built.

## VI. CONCLUSION

The study uses various models including descriptive study, correlation and regression in order to find out the cause and effect relationship between advertisement expenditure, sales and profit. Taking ten-year data of twenty manufacturing companies of India, the study tested whether advertisement expenditure impacts the sales, the profits and vice-versa.

The tools used (Regression and Correlation) clearly show that there is a significant relationship between advertisement expenditure, sales and profit.

Hence, we can logically conclude from the study that there is a one-sided relationship between advertisements, sales and profit wherein advertisement expenditure positively impacts the sales and profit of the business in case of Indian manufacturing companies.

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