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## THE CAUSATIVE EFFECT OF ADVERTISEMENT ON SALES

**JAKKIREDDY SURESH REDDY**

**ASST. PROFESSOR**

**DEPARTMENT OF MANAGEMENT STUDIES**

**RAJEEV GANDHI MEMORIAL COLLEGE OF ENGINEERING AND TECHNOLOGY  
NANDYAL**

**MULINTI CHINNA PULLAIAH**

**ASST. PROFESSOR**

**DEPARTMENT OF MANAGEMENT STUDIES**

**RAJEEV GANDHI MEMORIAL COLLEGE OF ENGINEERING AND TECHNOLOGY  
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### ABSTRACT

*The Advertising industry represents an important business sector with respect to national and international economics. An advertising campaign may satisfy a multitude of objectives for a firm. The commercials may be used to inform consumers about the usage features and benefits specific to a brand or a given product, or generate favorable attitudes and preferences amongst customers. Due to less product differentiation and intense industry competition, many marketers heavily involve in advertising and branding tasks. The Nike Inc business which is engaged in the design, development, manufacturing and global wide marketing and sales of footwear, apparel, equipment, accessories and services is one of the fastest growing companies in the global market. The current study examined the linear relationship between the advertising expenses and the sales revenues for the Nike Inc business on the secondary data for the six years. The two main objectives of this study are to i. To analyze the relationship between the advertisement expenditures and the sales revenues on the collected secondary data of Nike's Inc. ii. Providing the analysis of the relationship between advertising and sales in the advertising industry during the observed period. This study controlled for factors expected to affect sales revenues such as population size, price and inflationary effects. Results from the analysis show a positive and significant relationship between advertising expenditures and sales revenues.*

### KEYWORDS

advertisement expenses, sales revenue, secondary data, cause, impact, advertising and sales relationship.

### INTRODUCTION



One of the important IMC tools that help the marketer to create the awareness in the public and to increase the sales of a product is the advertising. Advertising is one of the tools to an organization to defend the competitors. Advertising is a prominent feature of modern business operations. One can encounter advertising messages, while watching TV, reading magazines, listening to the radio, surfing the internet, or even simply while walking down the street, as advertisement has a stimulating influence on purchasing behavior of the customer. That is why every organization with the expectation of earning return is investing millions of rupees or dollars on this mode of marketing communication.

But to what extent the sales are influenced by the advertisement is a debatable question. While one of the groups are in favour of the advertisement and the other group consider the advertisement as the wasteful expenditure.

But certainly there should be an impact of advertisement on sales and that could be the reason why the companies spend huge amounts of money on advertisement. And what is expected to be seen is which companies spend more heavily on advertisements and which do not spend more on advertisement.

Even till today there is no clear marketing literature on the integration of the advertisement expenditure on the sales figures and revenues but most of the marketing research studies have focused on the advanced countries like USA etc. The current study drafts the literature on the already available data and by studying the linkages between the advertisement expenditure and the sales revenues of the NIKE Inc.

Hence, in pursuit of their ultimate objective of increasing sales, every endeavor of each marketer is to make this mode of sales generation more effective. But advertisement effectiveness conveys different meanings to different groups.

The research study is planned and organized as follows. The present part introduces the concept of the research study and briefs the need of the study. The second presents state the objectives of the study. The third part reviews the literature available till now. The fourth part describes the methodology used for the study. And the fifth part presents the results and conclusions.

### OBJECTIVES OF THE STUDY

1. To find out whether an increase in advertisement expenditure leads to an increase in the sales revenues.
2. To find out the type relation between the advertisement expenditure and sales revenue.
3. To suggest to the marketers with respect to the need to the increase in the advertisement expenditure in order to increase the sales revenues.

### REVIEW OF LITERATURE

Till date many researchers had studied the impact of the advertisement on sales.

Brooker, Eastwood, Gray (1994) examine the influence of advertising on consumer demand.

Leach and Reekie (1996) analysed the effect of advertising on the market share of a brand.

Gabszewicz, Laussel and Sonnac (2001) studied the impact of advertising on the level of differentiation.

Kamber (2002) studied the factors affecting the advertisement such as company size or past sales.

Guo (2003), examined the relationship between advertising and consumption at macro level.

Weston (2004) studied the impact of advertising on breadth of

Ownership and stock liquidity in the secondary market.

Sundarsan (2007) examine the effectiveness of advertising on sales of small and large firms.

Chemmanur and Yan (2008) studied the effect of advertising in the market of new securities issues.

Different researchers had found various results.

Brooker, Eastwood, Gray (1994) reveal that newspaper advertising elasticity's were positive and significant.

Leach and Reekie (1996) unearth that the brand on the market share effect by distributed lag model.

Gabszewicz, Laussel and Sonnac (2001) reveal that advertising reduces differentiation between broadcasters.

Kamber (2002) uncover a measurable relationship between advertising expenditure and sales.

Guo (2003) find that advertising and consumption using the US data on advertising expenditure, personal consumption and disposable income.

Weston (2004) reveal that advertising affects the contemporary stock returns in the advertising year.

Sundarsan (2007) unearth that advertising has influenced sales, though its relative effectiveness was not the same for all the categories of firms.

Chemmanur and Yan (2008) reveal that decision of product market advertising and the decision on the amount of the money left on table during the going public process.

This study mainly focuses on the causative effect of advertisement expenditure on the sales revenues.

## RESEARCH METHODOLOGY

Simple Linear Regression Analysis for the Sales & Advertising Expenditure Data of Nike, where the Nike's data will be the experimental data. The predictor variable, sales (Y) depends on the response variable, advertising expenditure (X). The collected experimental data set is as follows:

TABLE 1

Year	Sales (Million US \$)-Y	Advertising Expenditure (Billion US \$)-X
2005	1,212	1.6
2006	1,392	1.74
2007	1,492	1.91
2008	1,883	2.31
2009	1,487	2.35
2014	2,693	3.03

Economic relationship may be there and may not be there between Advertising and Sales. There might be a positive or negative relationship between the two attributes.

### HYPOTHESIS

If there is a significant linear relationship between the independent variable X and the dependent variable Y, the slope will *not* equal zero.

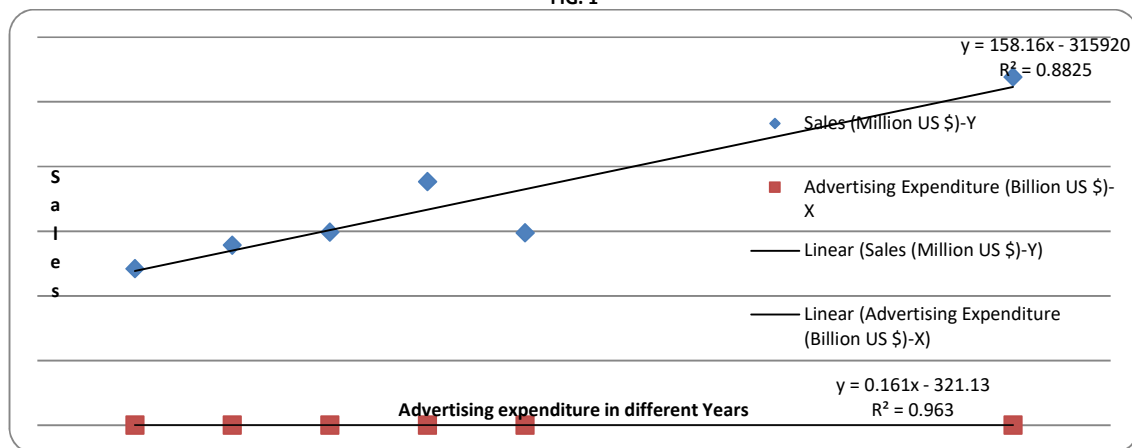
$$H_0: B_1 = 0$$

$$H_a: B_1 \neq 0$$

The null hypothesis states that the slope is equal to zero, and the alternative hypothesis states that the slope is not equal to zero.

Generate a regression plot and the regression line for the two variables to know the degree of the relationship between them.

FIG. 1



The fitted regression equation is

$$y = 158.1x - 31592$$

The coefficient of determination  $r^2$  and the correlation coefficient  $r$  quantify the strength of a *linear* relationship.

### Regression line

$$Y = 158.1x - 31592$$

### Coefficient of determination

$$R^2 = 0.882$$

The regression line as shown in the chart and the  $R^2$  value (0.882) known as the Coefficient of determination represent the moderate relationship between the Sales and advertising expenditure. That is 88.2% of the sample variation in y can be explained by the variation in x. And remaining 11.8 % variation in y cannot be explained.

"Predictor" (the intercept  $b_0$  is always referred to as the Constant.)

R-squared is the "percent of variance explained" by the model.

### Correlation Coefficient

$$r = \pm \sqrt{R^2}$$

$$= \pm \sqrt{0.882}$$

$$= 0.94$$

The sign of  $r$  depends on the sign of the estimated slope coefficient  $b_1$ .

- If  $b_1$  is negative, then  $r$  takes a negative sign.
- If  $b_1$  is positive, then  $r$  takes a positive sign.

That is, the estimated slope and the correlation coefficient  $r$  always share the same sign. Furthermore, because  $r^2$  is always a number between 0 and 1, the correlation coefficient  $r$  is always a number between -1 and 1.

The correlation coefficient explains the type of relation between the sales and advertising. Since the value of  $r = 0.94$  which is closer to +1 indicates that the two variables are positively related. (Positive linear relationship).

Residual errors will be there between the actual/observed values and the predicted values (Values on the trend line/fitted regression line.)

## ANALYSIS OF THE DATA

### REGRESSION ANALYSIS

TABLE 2

Year	Sales (Million US \$)-Y	Advertising Expenditure (Billion US \$)-X
2005	1,212	1.6
2006	1,392	1.74
2007	1,492	1.91
2008	1,883	2.31
2009	1,487	2.35
2014	2,693	3.03

### SUMMARY OUTPUT

TABLE 3

Regression Statistics	
Multiple R	0.929805647
R Square	0.864538541
Adjusted R Square	0.830673176
Standard Error	220.8994447
Observations	6

### MULTIPLE R

The multiple correlation coefficient is 0.929805647. This indicates that the correlation among the independent and dependent variables is positive.

### R SQUARE

The R square value equals to 0.86, which is not that very good fit but a good fit. 86 % of the variation in sales is explained the independent variable Advertising expenditure. Since the R square value is not very near to 1, the regression line doesn't fit the data properly.

### ADJUSTED R SQUARE

The adjusted R-square, a measure of explanatory power, is 0.830673. This statistic is not generally interpreted because it is neither a percentage (like the R<sup>2</sup>), nor a test of significance (such as the F-statistic).

### STANDARD ERROR OF THE REGRESSION

The standard error of the regression is 220.899, which is an estimate of the variation of the sales, about the regression line.

### ANOVA

TABLE 4

	df	SS	MS	F	Significance F
Regression	1	1245712.575	1245713	25.52869	0.007217938
Residual	4	195186.2586	48796.56		
Total	5	1440898.833			

TABLE 5

	Coefficients	Standard Error	t Stat	P-value
Intercept	-364.9	417.19248	-0.875	0.431
Advertising Expenditure (Billion US \$)-X	954.281	188.86964	5.053	0.007

### Significance F and P-values

The significance F value 0.0072 is less than 0.05, which means that the result 0.0072 is statistically significant. And the advertising is certainly influencing the sales. And moreover the P-value 0.0072 is less than 0.05, indicating that the value 0.0072 is statistically significant. And the 86% of the variation in sales is explained by the independent variable advertising expenditure.

### COEFFICIENTS

It can be concluded that, for each unit increase in advertising the sales increases by 954.28 units respectively. This is valuable interpretation and information.

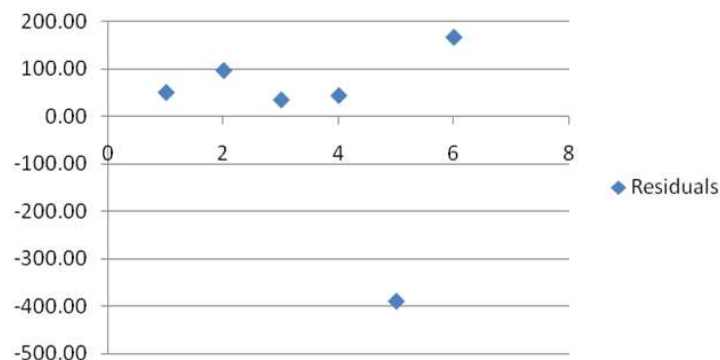
### RESIDUAL OUTPUT

TABLE 6

Observation	Predicted Sales (Million US \$)-Y	Residuals
1	1161.950022	50.05
2	1295.549418	96.45
3	1457.777255	34.22
4	1839.489814	43.51
5	1877.66107	-390.66
6	2526.572421	166.43

FIG. 2

## Residuals



**RESIDUALS**

The residuals show you how far away the actual data points are from the predicted data points (using the equation). For example, the first data point equals 1161. Using the equation, the predicted data point equals 1161, giving a residual of 50.

The scatter plot of residuals is as above.

**LIMITATIONS**

A large  $r^2$  value should not be interpreted as meaning that the estimated regression line fits the data well. Another function might better describe the trend in the data.

The coefficient of determination  $r^2$  and the correlation coefficient  $r$  can both be greatly affected by just one data point (or a few data points).

Correlation (or association) does not imply causation.

**CONCLUSION**

The study concluded that advertising industry represents an important business sector with respect to national and international economics. An advertising campaign may satisfy a multitude of objectives for a firm. The commercials may be used to inform consumers about the usage features and benefits specific to a brand or a given product, or generate favorable attitudes and preferences amongst customers. Due to less product differentiation and intense industry competition, many marketers heavily involve in advertising and branding tasks. The Nike Inc business which is engaged in the design, development, manufacturing and global wide marketing and sales of footwear, apparel, equipment, accessories and services is one of the fastest growing companies in the global market. The current study examined the linear relationship between the advertising expenses and the sales revenues for the Nike Inc business on the secondary data for the six years. The two main objectives of this study are to i. To analyze the relationship between the advertisement expenditures and the sales revenues on the collected secondary data of Nike's Inc. ii. Providing the analysis of the relationship between advertising and sales in the advertising industry during the observed period. This study controlled for factors expected to affect sales revenues such as population size, price and inflationary effects. Results from the analysis show a positive and significant relationship between advertising expenditures and sales revenues.

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