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Norman K. Plummer

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THE EFFECTS OF ADVERTISING

ON INTER-INDUSTRY GROWTH RATES

(TITLE)

BY

NORMAN K. PLUMMER

THESIS

SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENTS  
FOR THE DEGREE OF

MASTER OF ARTS IN ECONOMICS

IN THE GRADUATE SCHOOL, EASTERN ILLINOIS UNIVERSITY  
CHARLESTON, ILLINOIS

1972  
YEAR

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## CHAPTER I

### INTRODUCTION

"Hardly any business practice causes economists greater uneasiness than advertising." Lester Telser

Perhaps no single topic in economic thought has stirred as much controversy as the existence of advertising. Economists have debated its merits, demerits, and ramifications for many years; it has been characterized as everything from a complete waste of resources to one of the major determinants of economic growth. The purpose of this paper is to study one facet of this controversy; namely, whether or not the existence of advertising significantly contributes to economic growth. The hypothesis presented in this paper is that the existence of advertising has no significant effect on economic growth; it neither stimulates nor retards economic growth to any appreciable degree.

While the role of advertising in the determination of economic growth has been debated by economists, often at great length, little systematic study of this question has been attempted. This paper will attempt to fill this gap by providing an empirical study of the relationship between advertising and economic growth.<sup>1</sup>

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<sup>1</sup>The basic idea and format for this study is based on a study by James V. Koch of Illinois State University. "Advertising and Economic Growth" Journal of Advertising Research, Volume 11, Number 4, (August, 1971) pp. 36-39. However, several significant changes have been made and are noted in the text. Much of the same terminology and symbolism has been borrowed from Koch's study in order to facilitate a comparison.

Because of the lack of available information, difficulties encountered in finding figures limited this study to the period 1960-64. The length of period is not as critical as it might at first appear, since even in this short of a time period, many industries changed either in classification or definition. Because of this, it is desirable to use a relatively short time period in order to insure greater accuracy of results.

The study is arranged in the following manner. First, a brief study of the literature of the economics of advertising will be undertaken, followed by a description of the empirical work done in this paper. The conclusions of these studies will then be analyzed and placed within their proper perspective, both within the literature of advertising and economic theory in general. Finally, an attempt will be made to draw some conclusions about the role of advertising in a modern economy.

## CHAPTER II

### THE LITERATURE OF ADVERTISING

This section of the paper will concern itself with studies in the field of advertising and economic growth and analyze the relative position of this study within the framework of advertising literature.

#### A. Telser's Studies

Lester Telser of the University of Chicago is one of the pioneers of advertising theory. His two basic studies make required reading for anyone seriously interested in the economic effects of advertising. His first study<sup>2</sup> analyzes the effects of advertising on demand within the industry. He builds a theoretical relationship between the level of advertising and the cross-elasticity of prices among the firms in the industry and concludes that this relationship is inverse--products with a high cross-elasticity exhibit low levels of advertising and vice versa.

Telser then links the amount of advertising to the market structure. He states that, depending upon the characteristics of the products produced (primarily the level of cross-elasticity), the amount of advertising for the industry as a whole will vary.

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<sup>2</sup>Lester Telser, "How Much Does It Pay Whom to Advertise?", American Economic Review, LI (May, 1961), pp. 194-205.

His conclusions about the effects of advertising on economic growth are somewhat ambiguous. He concludes that advertising may have an effect upon the growth of the industry as a whole. However, he qualifies this statement by allowing for the type of product as being the dominant effect. The effect of advertising would then only be significant in a new industry, which must reach its potential market. In industries which have stabilized their market (all potential buyers are informed of the existence of the product), the effect of promotion would be minimal.

It is interesting to note Telser's reliance upon the nature of the product as a determinant of the amount of advertising and its potential effectiveness in stimulating economic growth. He never clearly establishes whether it is the advertising or the product itself which stimulates industrial growth. It appears, following his analysis, that industrial growth is based primarily upon the demand for a certain kind of product and that advertising has no significant effect on the demand for that product, except under certain special cases (i.e., low cross-elasticity of demand between products). Even under these special cases, the relevant criterion still is the nature of the product and the public's desire for it.

Telser's second study<sup>3</sup> involves an empirical test of various facets of the effectiveness of advertising.

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<sup>3</sup>Lester Telser, "Advertising and Competition," Journal of Political Economy, LXXII (December, 1964) pp. 537-62.



The first question tested is whether there is a strong relationship between concentration ratios and advertising levels. For the three years tested, he found a rather poor relationship between advertising and concentration ratios; that a three per cent increase of the advertising to sales ratio is associated with only eight one hundredths of a per cent (.08%) change in concentration for the industry. This result is also confirmed by George Stigler.<sup>4</sup>

The second question that Telser studied involved the relationship between the level of advertising and the stability of market shares within the industry. He found that advertising and share stability seem to be inversely related; the greater the amount of promotion within an industry, the greater likelihood of changing distributions of sales within the industry. In other words, the existence of large amounts of advertising in an industry tends to destabilize the market.

In the course of this study, Telser draws no implications about the relationship between advertising and economic growth. He merely analyzes the effects of advertising on market structure and its distributive effects within the industry.

#### B. Marcus's Study

A similar study was done by Matityahu Marcus of Rutgers University in 1969.<sup>5</sup> His results tend to contradict Telser's

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<sup>4</sup>George Stigler, "The Economies of Scale," Journal of Law and Economics, I (1958), pp. 63-8.

<sup>5</sup>Matityahu Marcus, "Advertising and Changes in Concentration," Southern Economic Journal, XXXVI (October, 1969), pp. 117-121.

findings. He found that there was a strong correlation between advertising intensity and changes in the concentration ratio for the industry. However, there is one crucial difference in definition between the two studies. Marcus used a measure of absolute level of advertising intensity, while Telser used an advertising to sales ratio and, because of this difference in definition, their results disagree. This result is explained by the fact that the absolute amount of advertising will tend to be higher in highly concentrated industries, because it represents one of the major barriers to entry into the industry. However, the fact that absolute advertising will tend to be higher does not necessarily imply a higher advertising to sales ratio, since the variation of sales in relation to growth is not specified.

#### C. Koch's Studies

James V. Koch of Illinois State University has done two major studies in the field concerning advertising and economic growth. His studies were used as a basic framework for the present study, although some significant changes were made in the definitions of certain variables and the measurements of industrial growth employed. However, for the most part, the results are comparable.

Koch's first study<sup>6</sup> measured the effects of advertising and product differentiation upon industry growth rates. His findings showed no significant relationship between advertising and economic growth. He found that advertising is statistically insignificant,

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<sup>6</sup>James V. Koch, "Advertising and Economic Growth," Journal of Advertising Research, XI (August, 1971), pp. 36-39.

although this variable had a consistent negative value, indicating an inverse relationship between advertising and economic growth.

Koch's second study<sup>7</sup> follows the same basic theme, although he does incorporate some significant changes. He expands the sample size from 55 four-digit industries to 242 four-digit industries, also including dummy variables to allow for regional markets, possible effects of imports on the market, and possible effects related to defense spending.

His findings indicate that advertising intensity, represented by the advertising to sales ratio, neither stimulates nor retards economic growth. However, seven out of the twelve coefficients had the expected negative sign. These results reinforce the findings that there is no significant relationship between advertising and economic growth.

An interesting sidelight of this study is the strong correlation found between growth rates and the extent that the industries were related to defense spending. This is significant because during the period of the study (1958-66), defense spending was strongly stimulated due to the increasing involvement in the Vietnam War.<sup>8</sup>

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<sup>7</sup>James V. Koch, "The Effects of Market Structure Upon Economic Growth," (unpublished), pp. 1-20. See footnote 10.

<sup>8</sup>For this reason, major industrial groups nineteen (ordinance and related weaponry) was excluded from the sample in my study. It was felt that the inclusion of this industrial group would unduly bias the data. Although the expenditures for the Vietnam War had not yet experienced their sharpest rise during this period (1960-64), the influence of the growing involvement was unmistakable.

This would represent an increase in demand for a selected type of product and the resulting increase in the growth of the industries that are connected with the production of that product. Once again, it appears that changes in the relevant demand for a product provides the strongest stimulus for economic growth.

D. Comaner and Wilson's Study

The Comaner and Wilson<sup>9</sup> study attempted to measure the correlation between advertising and profit rates among forty-one selected three-digit industries. They measured the profit rate among the industries and regressed this against the advertising expenditures among the industries, also taking into account the influence of market concentration, production scale economies, the absolute amount of capital required to enter the industry, and the rate of growth of demand. They found a strong and positive relationship between the level of advertising and the profit rate for the industry.

However, it is extremely difficult to draw any conclusions about growth rates from these findings. Although high profit rates do exist in advertising-intensive industries, this does not necessarily imply a relatively higher growth rate for the industry. While higher profits could provide a stimulus to new investment.

since the relation between advert.

There is also a serious question of causation: whether advertising causes higher profit rates and advertising; whether advertising causes higher profits or higher profits stimulate more advertising.

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<sup>9</sup> William S. Comaner and Thomas A. Wilson, "Advertising, Market Structure, and Performance," Review of Economics and Statistics, XLIV (November, 1967), pp. 423-39.

This concludes the analysis of the various statistical studies concerning advertising and various determinants of market structure and industrial growth. These represent the primary studies in the field. Unfortunately, the amount of research done in the area of the relation of industry growth to advertising is scant. There still remain many unanswered questions. One intriguing question revolves around the possible effects of advertising on industrial growth after the growth figures have been adjusted for such factors as changes in the demand parameters. If these figures are adjusted for such factors as changes in the population, technology, and other assorted effects, advertising may have a significant role. However, even if such a study was feasible, it is strongly suspected that the effect of advertising on the residual economic growth would be minimal.

## CHAPTER III

### THE EMPIRICAL STUDY

My study explored the relationship between advertising and economic growth in greater detail than the studies cited above. The next section describes the study and analyzes the results obtained from it.

The industry sample was composed of 54 Standard Industrial Classification (S.I.C.) manufacturing industries at the three-digit level of classification.<sup>10</sup> The full complement of 121 three-digit industries was not used because of lack of information and because changes in S.I.C. definitions over the relevant time period precluded the use of several industries. However, approximately 45 per cent of American manufacturing (excluding the ordinance industry<sup>11</sup>) is represented.

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<sup>10</sup>The S.I.C. classification system, compiled by the Department of Commerce, classifies various industries according to size. For example, a two-digit classification represents a major manufacturing group (i.e., the tobacco industry), while a three-digit industry represents a division of the two-digit manufacturing group (i.e., tobacco curing industries), with a four-digit industry representing a further subdivision (i.e., the cigarette industry). In this manner industries are grouped in a systematic way in order to facilitate analysis.

<sup>11</sup>The two-digit manufacturing group numbering nineteen is excluded from this study because of its strong relation to war spending levels. Although the expenditures for the Vietnam War had not yet experienced their greatest rise during this period, the influence on these industries by the war is unmistakably present. It was felt that this influence could have distorted the data and therefore, was excluded.

Of the twenty major two-digit manufacturing groups, nineteen are represented by at least one three-digit industry, and represent a wider cross-section than many comparable studies.<sup>12</sup>

The three-digit level of industry classification was chosen for two reasons. First, data on the advertising outlays for industry are only available through Internal Revenue statistics.<sup>13</sup> These figures are primarily three-digit classifications in recent years and solely of three-digit nature in past years. If a four-digit classification is used (Department of Commerce figures), it necessitates some sort of extrapolation of advertising and sales figures from the three-digit (I.R.S.) figures to four-digit (Department of Commerce) figures. Since the major emphasis of this study revolves around the effects of advertising and advertising to sales ratios upon economic growth, the use of extrapolation is open to some question as to accuracy and/or validity. This is, perhaps, one of the major reasons that Koch fails to reach statistical significance for the advertising variables in his two studies.

#### A. Description of Variables

##### 1. Economic Growth

Industry growth is represented by the ratio of industry size in 1964 to industry size in 1960. Industry size is represented by two measures: size of assets and size of receipts. Certain

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<sup>12</sup>See Koch, "Advertising and Economic Growth," p. 39. This study represented only 14 of the 20 major two-digit manufacturing groups, consisting of approximately 13 per cent of manufacturing. Comaner and Wilson's study, "Advertising, Market Structure, and Performance," p. 439, represented 36 per cent of manufacturing and covered 15 groups.

<sup>13</sup>United States Internal Revenue Service, Internal Revenue Service Source Book of Statistics of Income, 1960 and 1964.

alternative measures of industry size used by others, for example, Koch<sup>14</sup> (i.e., value-added, value of shipments, employment), were not used due to the necessity of extrapolation from the four-digit to the three-digit level of classification. Because of incomplete listings of all four-digit industries in the Census of Manufacturers, this extrapolation process would be open to considerable question as to its accuracy. The measures used in this study can be computed directly from Internal Revenue statistics with no extrapolation. On this basis, the measures used by this study would, in all probability, be a more accurate measure of economic growth for three-digit industries.

A second representation of economic growth was obtained by using the logarithm of the industry growth ratio. Since the simple ratio used in the first representation would be affected by the absolute size of the industry, the logarithm measure is employed. This usage adjusts for the effect of the size of the industry on the ratio, giving a more accurate measure of industrial growth. This usage was employed in Koch's second study,<sup>15</sup> and is employed here in order to more closely parallel his work. The logarithm of the dependent variables was used, while the independent variables were left unchanged.<sup>16</sup>

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<sup>14</sup>Koch, "Advertising and Economic Growth," pp. 36-37.

<sup>15</sup>Koch, "The Effects of Market Structure Upon Economic Growth," p. 3.

<sup>16</sup>The transformation is as follows:

$$Y = C + aX_1 + bX_2 \dots + X_n$$

to

$$\log Y = C + aX_1 + bX_2 \dots + X_n$$

This represents an adjustment for industry size.



## 2. Concentration in the Industry

The variable representing the degree of concentration in the industry, denoted 8FCONC in the statistical tables, is measured by the eight-firm concentration ratio. It was obtained from the 1963 Census of Manufacturers, published by the Department of Commerce, by extrapolation from the four-digit level of classification using a weighted average of the four-digit data. This was the method used by Telser in his original study.<sup>17</sup> While it may have some inherent drawbacks, it appears to be the best measure available. Further information on the extrapolation method can be found in Capital and Rates of Return in Manufacturing Industries, by George Stigler.<sup>18</sup>

If there is a significant relationship between the concentration ratio and industrial growth, then, in all probability, it would be positive. Reasons generally cited for this conclusion are such factors as higher profit rates stimulating investment and the ability to finance internally, among others.

## 3. Research and Development

The research and development figure, denoted RES/DEV, represents the average number of workers involved in research per one thousand workers in the industry. The source for these figures was the 1963 Census of Manufacturers, published by the Department of Commerce.

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<sup>17</sup>Telser, op. cit., p. 544.

<sup>18</sup>George C. Stigler, Capital and Rates of Return in Manufacturing Industries (Princeton, New Jersey: Princeton University Press, 1963), Appendix C.

The relationship of research and development to economic growth would appear to be positive, that is, the industry that invests more heavily in research would experience a higher growth rate due to improved products and production methods being discovered.<sup>19</sup>

#### 4. Product Differentiation

The advertising to sales ratio is included as a measure of the degree of product differentiation within the industry. The concept is borrowed from Koch's studies. The statistics used in computing this variable are found in the Internal Revenue Service Source Book of Statistics of Income for 1964.<sup>20</sup> The measure used for sales was receipts and the advertising variable was obtained directly from the data sheet. The product differentiation variable was denoted AD/SA in the statistical tables.<sup>21</sup>

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<sup>19</sup>

There are some authorities who disagree with this conclusion. See John Jewkes, David Sawers, and Richard Stillerman, The Sources of Invention, (New York: St. Martin's Press, 1959), Chapters IV, VII, and IX. Also, Jacob Schmookler, Invention and Economic Growth (Cambridge: Harvard University Press, 1966).

<sup>20</sup>

Internal Revenue Service, op. cit., 1964.

<sup>21</sup>

A specialization ratio for the industry was not used as a measure of product differentiation because differentiation can exist within an industry merely as a result of advertising with little or no actual physical differences between products (i.e., brand loyalties, etc.) This type of product differentiation is not reflected in the specialization ratio. Since the primary emphasis of this study is concerned with differences created by advertising, the use of the specialization ratio would be especially unsuitable.

A second rationale for the exclusion of the specialization ratio involves the necessity for extrapolation from the four-digit to the three-digit level of industrial classification, since this ratio is found in the Census of Manufacturers.

Product differentiation would tend to inhibit economic growth since as product differentiation increases, prices rise, tending to reduce sales. Therefore, the relationship would, in all probability, be negative.

#### 5. Advertising

Advertising as a variable represents the average amount of advertising done by a representative firm in the industry. The representative firm is computed in two ways. The first measure is the average plant size of all plants in the industry taken as a proportion of the industry as a whole and is denoted ADV1.

The second measure is patterned after one of Comaner and Wilson in a 1967 work.<sup>22</sup> It represents the average plant size of the largest plants representing fifty per cent of the industry as a whole and is denoted ADV2. The rationale for the inclusion of this variable is that it allows the exclusion of small plants which may not have realized all relevant economies of scale.

The existence of high levels of advertising would be expected to contribute to economic growth, since it would conceivably increase the demand for the product produced by the industry. Therefore, the expected relationship is positive.

The information used in computing this variable is found in the Internal Revenue Service Source Book of Statistics of Income for 1964.

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<sup>22</sup>Comaner, op. cit., p. 428.

## 6. Capital Requirements

The capital requirements variable measures the average amount of capital possessed by a representative firm. Two separate measures of this variable are used: the first measure represents the average size firm for the industry as a whole and is denoted KREQ1, and the second measure represents the average size of firms in the upper fifty per cent of the industry (the Comner and Wilson measure) and is denoted KREQ2.

The figures used in computing this variable are found in the Internal Revenue Service Source Book of Statistics of Income for 1964.

The capital requirements variable would be expected to be positively correlated to economic growth, since this is generally related to the concentration of the industry. Often, capital requirements represent one of the major barriers to entry into the highly concentrated industry.

## 7. Plant-Level Economies of Scale

The plant-level economies of scale variable represents the proportion of total industry output accounted for by a representative firm. Two measures of this variable are used and are denoted SCEC1 and SCEC2; their subscripts being consistent with the previous definitions.

It is expected that this variable is positively related to industrial growth since firms that have realized the relevant economies of scale can produce more at a lower price, thereby stimulating the growth of their industry.

The use of the representative firm in the framework of Comaner and Wilson's study is an attempt to determine a firm that has at least attained the minimum economies of scale inherent for the industry. More information on the calculation of this variable and the concept of the minimum optimal scale of plant can be found in "Advertising, Market Structure, and Performance," by William S. Comaner and Thomas A. Wilson.<sup>23</sup>

### B. The Results of the Tests

The first series of tests regresses the two measures of industry growth against the various indicators of market structure. The dependent variables were tested against two sets of independent variables. The first set of variables, subscripted one (1), represents the smaller measure of minimum optimal scale, as defined previously. The formulae take the following form:

- 1) growth in assets (Y) = C + a(8FCONC) + b(RES/DEV) + c(AD/SA) + d(ADV1) + e(KREQ1) + f(SCEC1)
- 2) growth in sales (Y) = C + a(8FCONC) + b(RES/DEV) + c(AD/SA) + d(ADV1) + e(KREQ1) + f(SCEC1)

The second set of variables, subscripted two (2), represented the larger measure of minimum optimal scale for the representative firm. This was the measure suggested by Comaner and Wilson.<sup>24</sup> The formulas are as follows:

- 1) growth in assets (Y) = C + a(8FCONC) + b(RES/DEV) + c(AD/SA) + d(ADV2) + e(KREQ2) + f(SCEC2)
- 2) growth in sales (Y) = C + a(8FCONC) + b(RES/DEV) + c(AD/SA) + d(ADV2) + e(KREQ2) + f(SCEC2)

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<sup>23</sup>Comaner and Wilson, pp. 428-29.

<sup>24</sup>Ibid.

The labels for the independent variables are the same as those employed by Koch. Any differences in their derivations are noted above. This was done to allow greater comparability between the various studies.

The results of the tests are summarized as follows:

TABLE 1

TEST SERIES 1

	<u>C</u>	<u>8FCONC</u>	<u>RES/DEV</u>	<u>AD/SA</u>	<u>ADV1</u>	<u>KREQ1</u>	<u>SCEC1</u>	<u>R<sup>2</sup></u>
growth assets-	1.236	.0029 (.96) <sup>a</sup>	-.0059 (1.43)	3.442 (.81)	-.0028 (1.23)	.0060 (.54)	-11.985 (.60)	.08
growth sales-	1.233	.0027 (.73)	-.0008 (.23)	1.066 (.28)	-.0022 (.92)	.0041 (.36)	-8.650 (.42)	.04
	<u>C</u>	<u>8FCONC</u>	<u>RES/DEV</u>	<u>AD/SA</u>	<u>ADV2</u>	<u>KREQ2</u>	<u>SCEC2</u>	<u>R<sup>2</sup></u>
growth assets-	1.252	.0024 (.88)	-.0049 (1.40)	2.998 (.75)	-.00009 (1.13)	-.00003 (.13)	.1191 (.43)	.07
growth sales-	1.266	.0012 (.43)	-.0007 (.21)	1.737 (.43)	-.00008 (1.00)	.00006 (.25)	.2020 (.71)	.04

<sup>a</sup>The value in parentheses represents the t-statistic for the coefficient.

No correlation was found between the growth in assets or sales over the time period with any of the independent variables derived under definition number one. However, it is interesting to note that the variables RES/DEV and ADV1 and ADV2 take on a consistently negative value.

The variable denoting plant-level economies of scale takes on a rather unexpected negative value under definition number one. This is probably due to the much smaller measure of plant-level economies of scale which allows smaller, less efficient plants to be included in the sample. The low level of the t-statistic associated with these coefficients casts serious doubts over its validity, even as to sign. It is

noted that under the larger measure of scale economies (definition number two), these variables take on the expected positive value. This is probably caused by the elimination of the least efficient firms from the sample under the requirements of definition number two. However, the variable is not significant at even the ten per cent level.

The set of tests involving variables as defined under definition number two failed to reach statistical significance. It is noted that the advertising variable is not significant, although the sign was of consistent negative value.

The negative signs on the research and development variables when regressed against growth in assets and receipts is consistent with the set of tests under the first definition. The negative value of the capital requirements variable when regressed against growth in assets is of such a low value that it merits no serious consideration, even as to sign.

The second series of tests involved regressing the value of the logarithm of the dependent variables. This procedure was suggested by Koch in his second study.<sup>25</sup>

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<sup>25</sup>Koch, "The Effects of Market Structure Upon Economic Growth," (unpublished), p. 3.

The formulas take the following form:

- 1) log growth in assets (Y) = C + a(8FCONC) + b(RES/DEV) + c(AD/SA) + d(ADV1) + e(KREQ1) + f(SCEC1)
- 2) log growth in sales (Y) = C + a(8FCONC) + b(RES/DEV) + c(AD/SA) + d(ADV1) + e(KREQ1) + f(SCEC1)
- 3) log growth in assets (Y) = C + a(8FCONC) + b(RES/DEV) + c(AD/SA) + d(ADV2) + e(KREQ2) + f(SCEC2)
- 4) log growth in sales (Y) = C + a(8FCONC) + b(RES/DEV) + c(AD/SA) + d(ADV2) + e(KREQ2) + f(SCEC2)

The results are summarized below:

TABLE 2

TEST SERIES 2

	C	8FCONC	AD/SA	RES/DEV	ADV1	KREQ1	SCEC1	R <sup>2</sup>
log growth assets	.0843	.0009 <sup>a</sup>	1.353	-.0021	-.0010	.0029	-6.321	.08
		(.88)	(1.10)	(1.80) <sup>b</sup>	(1.30)	(.79)	(.95)	
log growth sales	.0765	.0010	.8619	-.0009	-.0008	.0024	-6.375	.04
		(.90)	(.63)	(.65)	(.98)	(.57)	(.87)	
	C	8FCONC	AD/SA	RES/DEV	ADV2	KREQ2	SCEC2	R <sup>2</sup>
log growth assets	.0974	.0004	1.292	-.0021	-.00003	c	.0618	.07
		(.48)	(1.04)	(1.78) <sup>b</sup>	(1.5)		(.73)	
log growth sales	.0957	.0001	1.009	-.0008	-.00002	.00002	.0958	.04
		(.13)	(.69)	(.62)	(.67)	(.25)	(.93)	

<sup>a</sup>The value in parentheses represents the t-statistic for the coefficient.

<sup>b</sup>This value was statistically significant at the .10 level.

<sup>c</sup>The f-level was too low for computation.



The only value which gained statistical significance was the research and development variable when regressed against the logarithm of growth in assets. Under both definitions, it showed a value of  $-.0021$  with a t-value significant at the ten per cent level; this would suggest a negative relationship between research and development and growth in assets, although obviously a rather minor influence. There have been several studies which would tend to confirm this result.<sup>26</sup>

The explanation for this result is twofold. First, added expenditures for research represent increased costs for the industry. This would tend to decrease the amount of funds available for accumulation of various assets. Secondly, as pointed out in the Jewkes and Schmookler studies, much corporate research costs far more than the benefits derived from new discoveries. Both of these factors combine to cause a net loss in growth of assets for an industry which indulges in heavy expenditures for research and development.

The universally negative value for the research variable, while only gaining statistical significance in the second series of tests, may be considered an indication of a consistent relation. The role of research and development in industrial growth is a factor which merits more study by economists in order to learn its true significance to economic growth.

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<sup>26</sup>Jewkes, Chapters IV, VII and IX. See also Schmookler.

The rest of the independent variables failed to achieve significance, as in the first series of tests. Once again, it is interesting to note the consistent negative value of the advertising variable, which reinforces the data from the first series of tests.

The negative value for the scale economies of plant variable under the first set of tests is probably due to definitional problems, as explained above. It is noted that when the more stringent definition of scale economies is used, the variables take on the expected positive value.

On the basis of these tests, it can be concluded that for the group of industries studied, there appears to be no significant relation between advertising expenditures and industrial growth. It is also suggested, but not confirmed, by the tests that if such a relation existed, it should be of a negative nature; the existence of advertising would tend to inhibit the growth of an industry as a whole. Advertising appears to be, at best, useless in affecting economic growth and, at worst, a hindrance to the growth of an industry.

However, it is important to note that these results state nothing about the distributive effects of advertising within an industry. Advertising probably has a strong effect on the distribution of market shares within an industry, but this study only draws conclusions about the effect of advertising on the size of the market, not on the division of shares within it.

However, it can be noted that distributive effects can only take place at the expense of another firm in the industry. Total economic growth for the industry will not be significantly affected. Clearly, advertising plays no significant role in economic growth in the aggregate.

## CHAPTER IV

### ADVERTISING IN PERSPECTIVE

What then is the true role of advertising in a modern economy? A study of advertising in modern society would be in order to attempt to assess the role and the possible costs and benefits of advertising.

In 1965, advertising accounted for 3.54 per cent of personal consumption expenditures in the United States. It represented 3.25 per cent of the expenditures of disposable personal income or approximately 2.24 per cent of the gross national product.<sup>27</sup> Over the time period of 1935 to 1965, the relative importance of advertising as a percentage of gross national product has declined. However, it is difficult to ascertain if this decline is an accurate measure of the importance of advertising, since government percentages of gross national product have risen dramatically over the same time period. This may have the effect of distorting the data.<sup>28</sup> Clearly, however, advertising does represent an important variable in the economy.

Despite the significant proportion of resources devoted to advertising, it has been largely ignored by economists. Part of this seems to be a puzzlement among economists about the true role of

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<sup>27</sup> Jules Backman, Advertising and Competition, (New York: New York University Press, 1967), p. 173.

<sup>28</sup> Backman, p. 173-174.

advertising in the economy. Because analysis of advertising easily involves such factors as sociology and psychology, economists tend to be wary of studying it or attempting to analyze its effects.

Julian Simon points out another possibility as to why advertising is often excluded from economic analysis. He states:

...the reason is, I think, that promotion requires exchange. Advertising can speed and increase exchange of a good, but it cannot begin the process of exchange....But promotion cannot exist without exchange. Because promotion is not causal in the crudest sense, and because promotion has not been important historically, it has been reasonable to neglect promotion when considering the structure of development of economies. It is only when one focuses on the finer detail of economic development....that one sees that promotion might be important just as are other changes in commercial practice, because it is such "discontinuous" changes in the structure itself, each of which might be small, but which bulk large in the aggregate, which effect economic growth.<sup>29</sup>

Whatever the reason, the effects of advertising have usually been assumed away, ignored, or minimized in the literature of economics.

What role does advertising play in an economy? The most obvious role is dissemination of information about products, prices, quality, and any other factors which might affect transactions within the economic system. Stigler, in The Organization of Industry, makes a detailed analysis of the role of advertising in the market. He notes that the effect of advertising is to immensely reduce the cost of search for the potential buyer and seller.<sup>30</sup>

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<sup>29</sup>

Julian L. Simon, Issues in the Economics of Advertising (Urbana: University of Illinois Press, 1970), p. 172.

<sup>30</sup>

George C. Stigler, The Organization of Industry (Homewood, Illinois: Richard Irwin and Company, 1969), p. 176.

It also serves to distribute price information over a wider area, increasing the size of the potential market. He points out that this has a decisive effect on the dispersion of prices. Price differentials among products of similar or identical types tend to diminish or disappear.<sup>31</sup> In this way, the potential market where the consumer buys is increased at very little cost to him.

This function of advertising is clearly one of the most beneficial roles. By providing a means of rapidly distributing information, it moves the economy much closer to one with perfect knowledge, a desirable trait in any economy. However, this expansion is not without cost. Advertising on any major scale represents expenses to the firm. These expenses can be reflected in many ways, but most often in price increases (depending upon the elasticity of demand, among other things). The rise in price is probably less than the cost of search over the same market would have been to the consumer through the action of some sort of pooling effect or a form of economy of scale of advertising, but this type of cost is extremely hard to measure.

Obviously, much advertising goes far beyond the mere dissemination of information. Whether or not the increases in price that are experienced in order to finance the advertising are less than the potential cost of search is a debatable question. Casual inspection of the relation of profit rates to the amount of advertising may suggest that the benefits derived from more perfect information may be outweighed by the higher product costs. To the extent that these higher

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<sup>31</sup> Stigler, The Organization of Industry, p. 178.

prices restrict output or consumption may represent a net hindrance to the economy reaching its full potential. Many of the benefits of this new distribution of resources depends upon the use to which the increased profits are placed. Until these uses are analyzed and the flow of resources ascertained, no definitive statement can be made about the influence of advertising in the dynamic sense.

A possible benefit of advertising alleged by some writers is that it serves as a stimulus to research and development of new technology. For example, David M. Blank makes this statement:

"....advertising, by acquainting the consumer with the values of new products, widens the market for these products, pushes forward their acceptance by the consumer and encourages the investment and entrepreneurship necessary for innovation. Advertising, in short, holds out the promise of a greater and speedier return than would occur without such methods, thus stimulating investment, growth, and diversity."<sup>32</sup>

Former Secretary of Commerce Luther Hodges has stated that advertising stimulates research and development by providing a quick expansion of the market for a new good. He notes:

"....Without advertising's ability to stimulate the constantly expanding demand for goods and services, our gross national product would not have more than doubled in the past twenty years."<sup>33</sup>

My study found no justification for this position. No significant correlation was found between advertising expenditures and expenditures

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<sup>32</sup>David M. Blank, "Some Comments on the Role of Advertising in the American Economy--A Plea for Revaluation," in Reflections on Progress in Marketing, edited by George Smith, Northern Illinois University, 1964 Educators Conference, American Marketing Association, Chicago, Illinois, 1964, p. 151.

<sup>33</sup>House Committee on Interstate and Foreign Commerce, Hearings on Fair Packaging and Labeling, Part 2, 89th Congress, 2nd Session, Washington, D.C., 1966, p.1094.

on research and development. The existence of advertising throughout the economy may have some effect on the amount of research and development, but there is no direct correlation between advertising and research and development on an industry to industry basis.

However, as has been pointed out before, research and development programs have little to do with the growth of an industry over time. My study found the relationship between research and development and industrial growth was insignificant in six out of eight tests.<sup>34</sup>

Advertising probably plays a significant role in new and developing industries by providing information about new products, but in an already established industry, it makes no significant contribution to industrial growth.

However, it should be emphasized that this argument says nothing about possible new industries which are created as a result of research and development in established industries. No definitive study has been made of the distribution of research and development projects as to whether or not they are incorporated within or without the industry. Perhaps in this very indirect manner, advertising does play a role and yields a net benefit to society. However, until more definitive evidence is produced, one can only hypothesize that this effect is probably rather weak. Most certainly, it is not as strong as has been hypothesized by these and some other writers.

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<sup>34</sup>When the results were significant (two of the eight tests), the sign of the coefficients was negative, indicating that increasing amounts of money spent on research can actually inhibit the growth of an industry.

One final point to be made about corporate advertising lies in the political effect it exerts in society. As has been pointed out by William Domhoff, most newspapers and periodicals depend heavily on advertising as their main source of revenue. The threat of discontinuance of advertising by certain corporations can have a decided effect upon the editorial policies of these periodicals.<sup>35</sup> Through the use of certain kinds of financial pressure, the views of corporate big business can be felt throughout society as a whole. Whether or not this represents a net detriment to society depends upon one's personal views regarding the virtues or vices of big business. However, in all probability, the effect is significant.

This lengthy digression on the possible benefits and drawbacks of advertising has left us, as a whole, in roughly the same quandary that we originally began. While there are some definite drawbacks, it remains the task of the economist to further study the role of advertising in relation to the economy and society as a whole.

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<sup>35</sup> G. William Domhoff, Who Rules America?, (Englewood Cliffs, New Jersey: Prentice-Hall, Incorporated, 1967), p. 81.



## CHAPTER V

### FINAL CONCLUSIONS AND SUMMARY

The thesis was tested by use of a multi-variate regression analysis. Two separate measures of industry growth were used, as well as the logarithm of these measures. These values were regressed against various indicators of market structure and advertising. The independent variables represented industry concentration, research and development, advertising-induced barriers to entry, product differentiation, capital requirements, and relevant economies of scale.

As a result of the tests, the thesis was confirmed. The values for the coefficients involving advertising, advertising-induced barriers to entry, and product differentiation were found to be insignificant at even the ten per cent level of significance. It is noted that the coefficients for the advertising variable and the research and development variable were consistently negative. The research and development variable did gain statistical significance in two cases.

These figures indicate that advertising did not significantly contribute to the economic growth of the industries studied. It can be further hypothesized that, due to the consistent negative value of the coefficients, that if a statistically significant relation existed, it would probably serve to inhibit the growth of the industry.

The results of this study coincide with major studies of this nature in the field of advertising theory. While there may be significant relationships between such factors as changes in concentration, research and development, and profit rates, there is no significant relationship between advertising and economic growth.

The true role of advertising appears to lie in the area of stimulating new industries to reach the full extent of their market. In the role of distributor of information about buyers, sellers, prices, and products, the existence of advertising serves a valuable function.

The net benefits of advertising to established industries which have well-defined markets is less clear. Definitely, the benefits that the existence of advertising and promotion yield in such a setting are less than those in the setting of a new expanding industry. However, the need for further study into the nature and role of advertising still remains.

The solution to the problem does not appear to lie in the analysis of market structure or related factors such as advertising. In the final analysis, other factors appear to play the crucial role in industrial and economic growth. When these factors are specified and studied in some sort of comprehensive fashion, then perhaps the true value of advertising can be ascertained.

**APPENDIX A**

APPENDIX A

SUMMARY OF INDUSTRIES BY S.I.C. CLASSIFICATION

<u>Description</u>	<u>Classification</u>
1. Meat Products	201
2. Dairy Products	202
3. Canned and Frozen Foods	203
4. Grain Mill Products	204
5. Bakery Products	205
6. Sugar	206
7. Confectionary and Related Products	207
8. Cigarettes	211
9. Broadwoven Fabric Mills and Finishing: Wool	222
10. Textile Mill Products: Knitting Mills	225
11. Carpets and Rugs	227
12. Men's and Boys' Clothing	231
13. Yarn and Thread Mills	228
14. Women's, Children's, and Infant's Clothing	233
15. Miscellaneous Apparal and Accessories	238
16. Logging, Lumber, and Basic Wood Products	241
17. Millwork, Veneers, Plywoods, and Prefab- ricated Structures	243
18. Household Furniture	251
19. Furniture and Fixtures, except House- hold Furniture	259
20. Paperboard Containers	265

21. Bookbinding and Printing Trade Services	278
22. Drugs	283
23. Paints and Allied Products	285
24. Fertilizers and Other Agricultural Products	286
25. Tires and Inner Tubes	301
26. Footwear, except Rubber	314
27. Glass and Glass Products	321
28. Cement, Hydraulic	324
29. Structural Clay Products	325
30. Pottery and Related Products	326
31. Concrete, Gypsum, and Plaster Products	327
32. Blast Furnaces, Steel Work, Foundries, and Forgings	331
33. Smelting, Refining, etc., of Nonferrous Metals	333
34. Metal Cans	341
35. Cutlery, Hand Tools and General Hardware	342
36. Heating Apparatus (except electrical) and Plumbing Fixtures	343
37. Fabricated Structural Metal Products	344
38. Screw Machine Products	345
39. Engines and Turbines	351
40. Farm Machines and Equipment	352
41. Construction, Mining, and Material Handling Machinery and Equipment	353
42. Metalworking Machinery and Equipment	354

43. Special Industry Machinery and Equipment	355
44. General Industry Machinery and Equipment	356
45. Office, Computing, and Accounting Machines	357
46. Service Industry Machines	358
47. Household Appliances	363
48. Radio and Television Sets, except Communication	365
49. Ship and Boatbuilding and Repair	373
50. Optical, Medical, and Ophthalmic Goods	383
51. Photographic Equipment and Supplies	386
52. Watches and Clocks	387
53. Jewelry and Silverware	391
54. Toys and Sporting Goods	392

Note: This appendix lists the industries used in this study, as well as the S.I.C. classification number of each industry. For an explanation of the S.I.C. system, see footnote 10.

**APPENDIX B**

APPENDIX B

DISPERSION OF THE THREE DIGIT INDUSTRIES AMONG THE TWO-DIGIT  
MANUFACTURING GROUPS

<u>Two-Digit Manufacturing</u> <u>Group</u>	<u>Number of Three-Digit Industries</u>
20	7
21	1
22	4
23	3
24	2
25	2
26	1
27	1
28	3
29	0
30	1
31	1
32	5
33	2
34	5
35	8
36	2
37	1
38	3
39	2

Note: This appendix shows the distribution of the three-digit industries throughout the two-digit manufacturing groups, according to S.I.C. classification. For explanation of this classification system, see footnote 10.



**APPENDIX C**

## APPENDIX C

### EXPLANATION OF NOTATION OF VARIABLES

1. Assets represents growth in the industry's assets
2. log Assets represents the logarithm of the growth in the industry's assets
3. Sales represents growth in the industry's sales
4. log Sales represents the logarithm of the growth in the industry's sales
5. 8FCONC represents concentration in the industry
6. RES/DEV represents the amount of research and development
7. AD/SA represents the amount of product differentiation in the industry
8. ADV1 represents the amount of advertising present in the industry under definition number one<sup>1</sup>
9. ADV2 represents the amount of advertising present in the industry under definition number two<sup>2</sup>
10. KREQ1 represents the amount of capital requirements in the industry under definition number one<sup>3</sup>
11. KREQ2 represents the amount of capital requirements in the industry under definition number two<sup>4</sup>
12. SCEC1 represents the relevant economies of scale for the industry under definition number one<sup>5</sup>
13. SCEC2 represents the relevant economies of scale for the industry under definition number two<sup>6</sup>

note: detailed explanations of the derivation of these variables are found within the main body of the paper

- <sup>1</sup>see page 15.
- <sup>2</sup>see page 15.
- <sup>3</sup>see page 16.
- <sup>4</sup>see page 16.
- <sup>5</sup>see page 16.
- <sup>6</sup>see page 16.

**APPENDIX B**

APPENDIX D

DESCRIPTION OF THE VARIABLES

	<u>Variable</u>	<u>Mean</u>	<u>S.D.<sup>c</sup></u>	<u>S.E.<sup>d</sup></u>	<u>Range</u>	
1.	Assets	1.3351	.3395	.0462	2.4403	
2.	Sales	1.3471	.3385	.0461	2.2523	
3.	8FCONC	49.8109	22.7963	3.1021	86.6000	
4.	RES/DEV	10.1944	14.0803	1.9161	59.1420	
5.	AD/SA	.0172	.0157	.0023	.1037	
6.	ADV1	13.0948	35.3915	4.8162	236.9311	a
7.	ADV2	522.4683	952.2844	129.5895	5072.8750	a
8.	KREQ1	4.9851	7.8537	1.0688	37.0917	b
9.	KREQ2	217.0719	327.7966	44.6075	1286.144	b
10.	SCEC1	.0027	.0036	.0005	.0162	
11.	SCEC2	.1420	.2246	.0306	1.2476	

- a. figures shown in tens of thousands
- b. figures shown in hundreds of thousands
- c. represents the standard deviation of the variable
- d. represents the standard error

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