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# PRIVATE STRATEGIES, PUBLIC POLICIES & FOOD SYSTEM PERFORMANCE

**Advertising Expenditures in U.S. Manufacturing  
Industries, 1967 and 1982**

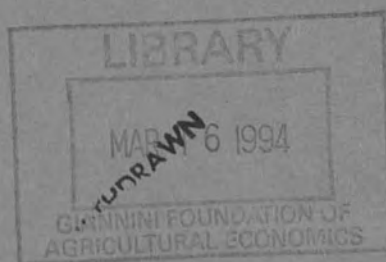
by

**Richard T. Rogers\* and Robert J. Tokle\***

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## Advertising Expenditures in U.S. Manufacturing Industries, 1967 and 1982

Advertising is a major firm strategy in much of our modern economy. In many consumer markets with oligopoly structures, advertising provides an important nonprice competitive weapon. For consumer, nondurable products it is perhaps the most significant method of creating and maintaining product differentiation. It is also closely associated with other product differentiation strategies such as packaging and new product introductions. Economists interested in market behavior and performance have come to recognize that they cannot ignore advertising's effects on firm rivalry or consumer preferences. Although theoretical economists were late to incorporate advertising in their economic models, they still preceded many of those doing empirical work, as applied researchers were frustrated by the lack of advertising data. Dorfman and Steiner nearly 40 years ago drew attention to the importance of advertising in their seminal article on optimal advertising intensities. Telser followed a decade later with one of the first empirical works examining advertising and competition. The decade of the 1970s saw many studies that established advertising as an important economic variable in studies related to market power and performance.

It is surprising that so much empirical work was eventually done, given the limited data available on advertising. Most of the empirical work involved cross-sectional studies of manufacturing industries, usually at the four-digit Standard Industrial Classification (SIC) level. The Census of Manufactures provided most of the needed data on such commonly used economic variables as concentration, size, capital-output ratios, minimum efficient size, value-added, and price-cost margins, but the Census does not publish any data on advertising expenditures. In fact, the way Census price-cost margins are calculated advertising remains in the margin, a substantial weakness of the proxy measure. Some authors used subjective binary variables to classify industries into consumer-producer categories. Others began to use discrete product differentiation classifications based often on the advertising expenditures of the leading companies that were in an industry.

The reason for these approaches was the unavailability of advertising data by industries. A researcher could obtain some advertising data for entire companies but the growing diversification of firms limited the usefulness of such data for industry studies. The first data source for advertising data by industry groups (roughly a three-digit SIC level) came from the Internal Revenue Service (IRS). Telser's seminal article on advertising and concentration used this source. Unfortunately, the IRS data industry groups are too broad for economists trying to examine market behavior and performance.

### **The Search for Industry Level Advertising Data**

Although the IRS data are helpful in providing total advertising data for large sectors of the economy, the data have several disadvantages that render them nearly useless to a researcher interested in narrower product categories, such as the four-digit SIC industry. The IRS data are limited to corporations and rely on what corporations report as advertising expenditures to the IRS. Although advertising is treated as a current expense subtracted from taxable income, what is reported to the IRS as advertising may vary from company to company, making the data less consistent than the category implies. Of even greater significance, a corporation is assigned to a single IRS category unless the corporation reports to the IRS by divisions or subsidiaries. As companies have become increasingly diversified, the IRS data have become less useful. For example, prior to 1970 the data for food and

kindred products included the advertising expenditures of the Miller Brewing Company. In 1970, Philip Morris acquired Miller and subsequently Miller's beer advertising expenditures have been included in the IRS tobacco category. The narrower the IRS category, the more distorted the data are likely to be. Thus, the IRS data are best used in the most aggregated form possible.

Another choice of advertising data is that of advertising data compiled by private firms or public researchers based on information found in company annual reports and financial reports (e.g., 10k forms). However, these data suffer for many of the same reasons found with the IRS data. Without line of business reporting, the diversification of the modern firm prevents the use of any data reported at the company level for calculating industry level data.

A most promising new source of economic data that contained information on advertising expenditures by industries was the Department of Commerce's Input-Output (IO) Analysis for the United States economy. These data are often embraced as the major contribution to the study of advertising at the industry level. They are available for most four-digit industries and cover most forms of advertising and promotional expenses. Since these data could be matched to Census industries, economic researchers were enthusiastic about their beginning availability. For example, Ornstein and Lustgarten expressed the delight of many economists over the IO data by writing:

In order to eliminate incompatibility in industry aggregation between advertising data and concentration ratios (a problem in studies using IRS data), advertising figures for four-digit industries were drawn from the U.S. Input-Output Tables. . . . Advertising in each industry includes all major advertising expenditures except within-firm expenditures. This tends to bias advertising downward for industries with large in-house advertising departments. However, these advertising figures are much more comprehensive than media trade sources. They include, for example, talent and production costs, signs and advertising displays, art work, postage and printing and space and time by media including newspapers, periodicals, network and spot TV, network and spot radio, and outdoor, and motion picture.

Ornstein (1977) has published these advertising data for the years 1947, 1963 and 1967 as a service to other researchers, as they do not have to repeat the extraction of the data, the transfer to four-digit SICs, and the calculation of the advertising-to-sales ratios. However, the IO advertising data have several serious errors. The broad scope of the advertising data as well as some of the methods used in constructing the data series should concern researchers. The individual advertising methods are lost to the researcher and hence a researcher cannot test the hypothesis that not all forms of advertising produce the same effect. For example, Mueller and Rogers show that it is electronic advertising, mainly television, and not the print media advertising that is associated with increased industry concentration.

Advertising data compiled by Leading National Advertisers, Inc. (LNA) in conjunction with the Arbitron Company are the best data available to the economic researcher who needs detailed data. Although the data are restricted to the main measured media targeted at wide consumer audiences, their rich detail provide the researcher with substantial flexibility. LNA has been involved in publishing advertising data since at least 1954 and the number of media covered has expanded from just four in 1954 to ten today. Some of the added media reflect improved coverage by LNA but others were added when new media emerged (e.g., cable TV). In 1954 only network television and radio, magazines, and Sunday newspaper supplements (e.g., Parade) were reported. Today, LNA has added advertising from outdoor billboards, newspapers, national spot radio, spot television, cable television networks, and syndicated television. Although the network advertising is continuously monitored,

most of the media are represented only by selected markets or leading publications. For example, in 1990 LNA compiled advertising data in 176 consumer magazines and in 72 newspapers. Using time and space measurements of the advertisements, the advertising expenditures are estimated and assigned to company and product records. Thus the data are available by both company and by branded products with the latter available arranged by product groups based on LNA categories. Only those companies, or brands if the parent company cannot be identified, that spend at least \$25,000 in the year are included in their publications.

The major drawback to the LNA data is their expense. The data are chiefly compiled for firms choosing to monitor advertising levels and rivals' strategies and are thus mainly sold to corporate customers who are major advertisers themselves. Electronic versions of the data exist but are not available to academic researchers at this time. However, LNA has created a reduced academic rate for those willing to buy data that are at least a year out of date. Even with that restriction, the data are still more timely than government census data. The data are copyrighted and LNA is an aggressive protector of its property. No photocopying is allowed, but they have allowed publication of their data that has been transformed in a manner unavailable from themselves. To learn more about their data and their academic rates, call 1-800-LNA-DATA and ask for a description of the data including the pages entitled "Facts You Should Know." The data are available in two major publications. One is the Company/Brand report where the data are arranged alphabetically by company name, but with each company's list of advertised products given. The second publication is the Class/Brand report which is most useful for industry level research. It is arranged by LNA product codes but with the parent company identified and the advertising expenditures given for each product in that LNA code.

The most troublesome feature of using the LNA data is converting from LNA product codes to census SIC codes. There are about 240 LNA product codes related to manufacturing industries and 450 census four-digit SIC manufacturing industries. The task is to convert the LNA codes to the SIC codes. The inability to buy the data in electronic form is also a major setback. However, the rich detail of the LNA data allows the researcher to aggregate only those advertising data that belong together. The first major research attempt based on the LNA data by a public researcher was done by the late Robert Bailey of the Federal Trade Commission. He started with the 1967 LNA Class/Brand publication and supplemented it with newspaper advertising from Media Records, Part Two (Blue Book), Newspaper Advertisers, 1967; and outdoor advertising from LNA Rorabaugh Services, LNA Outdoor Advertising Expenditures, January-December 1967 (compiled and published in cooperation with the Institute of Outdoor Advertising). Unfortunately, Bailey combined the newspaper advertising data along with the newspaper supplements advertising and hence the researcher cannot keep the two separated for comparisons over time.

To each product's advertising expenditure Bailey assigned a five-digit census SIC code (e.g., Folger's instant coffee, SIC 20952) based on the 1967 SIC manual. After this massive undertaking was completed, it was then an easy matter to aggregate the data to the five-digit SIC product class level or to the more widely used four-digit SIC industry level. If products were defined too broadly, they were assigned as narrowly as possible (e.g., Borden's Dairy Products, SIC 202) and required allocations to the proper four-digit SIC based on either the remainder of the company's advertising or the percentage of the three-digit SIC's total advertising accounted for by the various four-digit industries involved. Such allocations were rare and did not represent a substantial amount of advertising dollars.

Motivated by Bailey's original work, Rogers duplicated the procedure for the census years 1954, 1972, and 1977 for products related to food and tobacco products and other grocery store

products (e.g., hair preparations). The assignment of a SIC code to each product's advertising expenditure was a time consuming task. For example, in 1972 some 5,000 lines of food and tobacco advertising expenditures had to receive a SIC code. The assignment of a SIC code was often straightforward but sometimes proved difficult and required contacting Census personnel to assist in the assignment. Sometimes the company had to be contacted to learn more about the product to allow proper classification. For example, a call to a company to learn if a product was frozen or canned would allow assigning the correct SIC.

In addition, Rogers reclassified Bailey's entire data set for all manufacturing to correspond with the revised 1972 SIC codes. Tokle and Rogers collaborated to repeat the procedure for the year 1982 using only the LNA data. Rogers classified the some 5,000 food and tobacco products into four-digit SICs and Tokle assigned SICs to the remaining 12,000 products. For more information regarding the details of this procedure see Rogers (1982) and Tokle (1986). This created a new data set based on the census year 1982 compared to the 1967 data originally compiled by Bailey. As will be discussed below, only those SICs that corresponded to meaningful economic industries and had comparable census data from 1967 to 1982 were included.

It is our opinion that it is only this painstaking method that allows the desired goal of Ornstein and Lustgarten of eliminating "incompatibility in industry aggregation between advertising data and concentration ratios" to be achieved. By examining every line of advertising data, we were able to exclude advertising expenditures that did not relate to product differentiation. Industry-wide associations often spend substantial sums advertising the merits of their industry's product without any mention of specific brands (e.g., Drink Milk advertisements by the American Dairy Association). Such advertisements do not belong in a study seeking to examine advertising and market structure. These ads are more likely the response of an industry characterized by near perfect competition as opposed to the advertising rivalry found in imperfect competition.

For a brief period in the 1970s the Federal Trade Commission's line-of-business program collected economic data, including media advertising and selling costs data, on about 500 large firms by their product lines. These data were then aggregated, using SIC definitions for the three years 1974 to 1976. Thus industry-level measures, based on the largest manufacturing firms, for both media advertising expenditures and total selling expenses became available. Total selling expenses far exceeded the media advertising with the media advertising-to-sales ratio for all manufacturing weighted ratio of 1.2 percent compared to 6.7 percent in using the broader total selling expenses (Connor et al.). Weiss, Pascoe, and Martin used the data and found that advertising and other selling expenses were more likely to be complements than substitutes. Hence, to rely only on media advertising does omit the majority of selling expenses but it has the advantages of being clearly defined and for some purposes a better measure (e.g., product differentiation), and it is positively correlated with total selling expenses.

### **Comparing the IO Advertising Data to the LNA Data**

The researcher interested in advertising at the industry level over time is faced with just two sources. The Input-Output data are available on electronic tape and total advertising expenditures are easily converted from the Bureau of Economic Analysis codes used by the IO tables to SIC codes. The data are available at several academic institutions and can be purchased at a nominal charge from the government. The IO data are reported for census years, whereas the LNA data are reported annually (even quarterly). The LNA data, on the other hand, are expensive, copyrighted, not sold to

academics in electronic form, and have no guidance for converting from the LNA codes to the SIC codes. Hence, the LNA data must be sufficiently superior to warrant the cost and trouble.

Rogers studied the two data sources in detail for the year 1972. The Input-Output advertising data includes all of the LNA advertising data. Researchers at the Commerce Department then supplemented the LNA with additional advertising data and reached a total for each industry. This attempt at an all inclusive advertising measure without maintaining the individual media is a frustration to the researcher and is likely to have introduced errors. For example, they allocated total transit advertising equally among the nine major users of transit advertising as given by Advertising Age. It may have been better to leave the total transit figure for a grand total and not attempt to allocate it to specific industries.

Since the final IO tables do not report individual media separately, a researcher is unable to test for different effects from different media (e.g., print versus electronic). More importantly, the Commerce researchers used a simple method to allocate the LNA data to individual industries. Since most LNA product categories involve more than one SIC industry, LNA data were allocated to industries by value-added weights.

The allocation of the LNA product totals to SIC industries by value-added weights can create major errors. Fortunately, many LNA codes align directly with a SIC four-digit industry (e.g., cigarettes). However, whenever a LNA category involves more than one SIC four-digit industry, then we are faced with the tedious task of actually assigning each product's advertising data to the appropriate SIC that can create an industry total. As an example of this task, the products in the LNA code F111, Sugar, Syrups, and Artificial Sweeteners, are given in Table 1 for the year 1987. There are four SIC industries involved in this LNA category and to allocate the total advertising by value-added weights from these four industries would introduce dramatic errors. The artificial sweeteners (e.g., Nutrasweet) did the majority of the advertising and these advertising expenditures belong to SIC 2869. Only assigning a SIC code to each product in the LNA data allows the proper aggregation to four-digit SIC industries. Of course, the researcher must possess sufficient knowledge to make these SIC assignments and mistakes are possible. The Census SIC manual and its numerical listing of manufacturing products are critical reference resources in making the SIC assignments.

All of the data in Table 1 are from LNA, except for the SIC codes, which were added by Rogers. An additional advantage, although minor in the dollar amount involved, is the ability to account for joint advertisements (e.g., Karo Syrup and Bakers Chocolate). The approach used by the authors was to assign half of the advertising expenditures to each product and since each belongs in a different SIC industry, this refinement improves the final aggregation to the industry level. For example, half of the advertising expenditures for Karo Syrup and Bakers Chocolate went to SIC 20993, while the other half went to 20669. Another point that can be made here is that the LNA data can often be assigned to a more detailed SIC than just the four-digit industry. This more precise assignment is critical to industries such as SIC 2099, miscellaneous food and kindred products, because at the four-digit industry level the observation is not for an economic market whereas it contains several five-digit product classes that correspond with economic markets.

A selected comparison of the Input-Output data and the LNA data is given in Table 2 to show the problems involved in the IO data for 1972. Ten of the 45 food industries that had the most dramatic differences are given here. Although only the total advertising expenditures are available from the Department of Commerce Input-Output tables, they provided Rogers access to the detailed data used to assemble the total advertising expenditures. Since the IO data used the LNA data but supplemented with additional sources, the IO total should always equal or exceed the LNA total, but in



three of the ten industries the reverse is true. In addition, the IO data have three media that relied exclusively on the LNA data, yet large differences exist even for these media. Also, the IO data used an adjustment figure that needs explanation, especially in those cases where it accounts for the majority of the data (e.g., SIC 2023).

The differences found in Table 2 are related to the procedure used by researchers at the Department of Commerce to allocate the advertising expenditures for an LNA product category to all the SIC industries involved by using value-added weights. Whenever a LNA category matches a Census four-digit SIC, the differences are not found (e.g., beer). The major problems are found when a LNA category contains more than one four-digit SIC. If an LNA category contained two or more SIC industries the total advertising expenditures for the LNA category were distributed by value-added weights. Hence, the SIC industry with twice the value-added of the other received twice the advertising. Such a rule avoids the tedious task of actually assigning SIC codes to the individual lines of the LNA data but does introduce errors.

Some of the errors are dramatic. For example, SIC 2067 (chewing gum) is in the LNA category, candy and gum. Since the value-added for chewing gum in 1972 was \$228.4 million versus \$1,398.3 million for SIC 2065 (candy) plus SIC 2066 (chocolate) the chewing gum industry only received 16 percent of the totals from the LNA data. Had researchers assigned SIC codes to the individual products (e.g., Wrigley's Spearmint Gum) advertised in the LNA candy and gum category, they could have then aggregated the proper amounts to each industry. This more tedious method assures the correct amounts being allocated to the relevant industries, and in 1972 chewing gum's television advertising (network plus spot) was \$35.7 million, not the \$9.5 million given in the IO data. For the three media listed in Table 2, the IO data relied exclusively on the LNA data for its source of information. Hence the differences found in these three media are the result of the value-added allocation rule and not additional data.

The value-added allocation rule causes substantial problems for researchers interested in industry advertising data. The chewing gum example demonstrates this concern. A researcher testing the hypothesis that there is a positive relationship between concentration and advertising will have a bias toward an insignificant relationship if the IO data are used. The four-firm concentration ratio for the chewing gum industry was 87 in 1972 as opposed to 32 for candy. The IO data biases candy's advertising upward and chewing gum's downward and hence biases any positive relationship that may exist toward insignificance.

The differences between the IO data and the LNA data given in Table 2 underscore the importance of data quality. Researchers embraced the IO advertising data as the answer to an omitted variable problem without a thorough examination of their quality. Researchers must be reminded that data quality deserves as much attention as model specification and other econometric questions.

Given the advertising data sources available, the authors contend that the measured media data from LNA offer the best source for studies requiring data at the four-digit industry or five-digit product class level. The use of the LNA data does require the substantial additional work of assigning SIC codes to the advertising of individual products and the data are limited to the major media aimed at final consumers. Once the SIC assignments have been made, the researcher is able to aggregate the data in any manner required. The maintenance of individual media allow the testing of additional hypotheses. It is only the rich detail of the LNA data that provides the researcher the opportunity to achieve the desired goal of matching advertising data to Census industry and product class data.

## The Industries Included in the LNA-Based Advertising Data

The original purpose for the development of an advertising data set by four-digit SIC industries was to study concentration change in manufacturing industries (see Mueller and Rogers; and Tokle, Rogers, and Adams). Mueller and Rogers relied on Bailey's 1967 advertising data. They argued that this single year would capture the relative opportunities for product differentiation among the various industries. However, they were criticized for the use of single year's advertising by others who felt that a change in advertising variable was more appropriate. Rogers tested this idea for food and tobacco product classes and found only moderate support for the change variable. Tokle, Rogers and Adams directly accepted the challenge of developing an additional year's advertising data from LNA. They duplicated the methods used by Bailey for the year 1982 and incorporated both the 1967 data and 1982 data in a concentration change study over the period 1967 to 1982.

The resulting advertising data set has individual media advertising for each four-digit industry that was considered an appropriate observation for a change in concentration study over the period 1967 to 1982. The complete list of industries and the total advertising expenditures and the advertising-to-sales ratios are given in Appendix 1. In 1967 spot radio advertisements were added to the LNA data by Bailey but here they were excluded from the 1967 measured media total to be more comparable with the 1982 total media expenditures (see discussion in the next section). A complete data set is available from the authors on electronic disk that includes the individual advertising media in 1967 (including spot ratio) and 1982.

Out of a total of 450 four-digit SIC industries in 1982, 284 are contained in the data set. The elimination of the 166 industries was caused by an attempt to include only industries that had comparable data from 1967 to 1982 and approximated an economic market. Over 100 (101) industries were lost because their definitions were changed from 1967 to 1982. The Census periodically redefines manufacturing industries to reflect changing patterns of production and consumption. In these revisions some industries are combined with others, some new industries emerge, and some industries have products added or deleted from their definitions. A major Census revision took place prior to the 1963 Census and hence those researchers wishing to study a longer time span than we chose here suffer a greater loss of industries (e.g., Mueller and Rogers had 165 industries for their 1947 to 1977 concentration change study).

Another 60 industries were eliminated because they were "not elsewhere classified" (NEC) industries. The NEC industries are collections of products that do not fit into better defined industries and hence are an aggregation of miscellaneous products that fail to approximate an economic market. Five additional industries were eliminated for various reasons. Butter (SIC 2021) was dropped because of problems the Census had in calculating the market's concentration in 1967. Prior to 1972 the Census had failed to treat member plants of agricultural cooperatives as a single entity. Thus, the CR4 for butter jumped from 14 in 1967 to 37 in 1972 once the Census properly handled cooperatives.

Another industry, SIC 2875 (nitrogenous or phosphatic fertilizers, mixed only) was deleted because the final product cannot be distinguished between SIC 2873 (nitrogenous fertilizers) or SIC 2874 (phosphatic fertilizers). The only difference is that in SIC 2875 the fertilizers are produced from purchased materials, whereas in SIC 2873 and SIC 2874 the materials are produced in the same establishment. Since both SIC 2873 and SIC 2874 were omitted because of definitional changes in 1972, SIC 2875 was also omitted. Another industry, SIC 2992 (refining oil and greases from purchased materials), was omitted because even though the Census makes the distinction between refined oil made from materials processed within an establishment as opposed to purchased materials the final product is identical. If the oil is refined from materials produced in the same establishment, then it is

classified as SIC 2911 (petroleum refining). In 1977 the value-of-shipments from SIC 2992 was 1.8 percent of that in SIC 2911. Since SIC 2911 greatly dominated the oil refining industry, SIC 2911 was retained and SIC 2992 was deleted.

The last two industries, SIC 3911 (precious jewelry) and SIC 3961 (costume jewelry) were deleted because we were unable to determine to which industry to assign the LNA data. It is common for firms to produce both precious and costume jewelry, and the differences between the two industries is often only the cost of a semi-precious stone (usually at a cost of \$3 to \$5). This difficulty, combined with the fact that concentration in these two industries was moving in opposite directions, made us reluctant to include either industry in our study. Since the 1982 advertising data set was developed for use in a concentration change, and we were not sure whether a jewelry advertisement belonged to SIC 3911 or SIC 3961, both were omitted.

In three other cases we had the same problem of determining which industry to assign the LNA advertising expenditures, but here the problem was related to the Census classification system's production orientation. As in oil refining and fertilizers, the Census classifies establishments that produce identical final products into separate industries if the establishments purchase the materials from others or process the materials in the same establishment. Similar final products are produced in SIC 2011 (meat packing) and 2013 (sausages and other prepared meats) but in the former the animal is slaughtered in the same establishment. Similarly for SIC 2041 (flour and other grain mill products) and SIC 2045 (blended and prepared flour), except the distinction here is based on whether the products were made from flour milled in the same establishment. Finally, refined sugar is identical whether it is made from sugar cane or sugar beets, but in the Census classification the former is SIC 2062 and the later is SIC 2063. In all of these cases, we could not be certain how to allocate the advertising data among the similar industries so we did not even try. Instead we split the total advertising in each of the three cases, based on their respective value-of-shipments. For example, total refined sugar advertising was allocated to SICs 2062 and 2063, based on their value-of-shipments. This resulted in each similar industry having the same advertising-to-sales ratio.

These frustrations in the assignments of SICs to individual product advertising expenditures reveal that the LNA data have their difficulties. The more familiar the researcher is with an industry, the less of a problem it is. We relied heavily on trained Census personnel that were experts in particular areas of manufacturing to assist us in making some of the more difficult assignments. A team of experts, assembled for their expertise in different areas of manufacturing, would make the task of SIC assignments to the LNA data more precise and speed the assignment process.

### **Media Advertising, by Industries, 1967 and 1982**

The 1967 advertising data include two more media than do the 1982 data. As previously mentioned, the 1967 data came from the FTC where Bailey had supplemented the 1967 LNA data with data on newspaper advertising (unfortunately he combined it with newspaper supplements, hence it cannot be separated out for comparisons with 1982 data that just have the newspaper supplements) and spot radio advertising. The 1982 data relied only on LNA data. But by 1982 LNA was reporting advertising expenditures in six measured media (network and spot television, network radio, magazines, newspaper supplements, and outdoor). Today LNA has broadened its coverage to include cable and syndicated TV, national spot radio, and newspaper advertising.

In 1967, the 284 industries included in our data set accounted for \$3.1 billion dollars of media advertising. This amount is 38 percent of the total manufacturing advertising expenditures

recorded by the IRS for 1967. Television was the dominant media, accounting for 65 percent of the eight media included in the 1967 LNA data. By 1982 the 284 industries spent nearly \$9 billion in the six media included by LNA, which represented 28 percent of the total manufacturing advertising recorded by the IRS for 1982. (In contrast, the total value of shipments of these 284 industries accounted for 65 percent of the total for manufacturing in 1967, and 64 percent in 1982.) The decline in advertising coverage is related to the lack of newspapers and spot radio in 1982, but that alone cannot explain the decline of 10 percentage points. Television again dominated the 1982 data, with 72 percent of the total advertising expenditures (which cover two fewer media than in 1967). Since the IRS does not record advertising by media, we cannot give the percentage our data represents of an all manufacturing total expenditure on television advertising, but it should be quite high, since LNA does its most inclusive coverage in its coverage of television advertising.

The most striking observation in examining the advertising by industries is the number of industries that did not advertise at all in these measured media. In 1967, 109 of the 284 industries did not use measured media advertising at all. By 1982 the number of industries with no recorded advertising data had decreased to 89, but many industries had only minor expenditures and had advertising-to-sales ratios (the industry's value-of-shipments given by Census data is used for sales) that rounded to 0.00 percent. Although the main focus is on advertising-to-sales ratios, it is interesting to see who the largest advertisers were in each year. The leading 25 industries by total media advertising expenditures in 1967 are given in Table 3. The largest spender was the toilet preparations industry, SIC 2844, which spent \$389 million in 1967. It was still the largest spender in 1982, when it recorded advertising expenditures of \$1,121 million (Table 4). In fact, there is very little change in the rankings of the top industrial advertisers between 1967 and 1982. Out of the top 10 advertisers in 1967, only the tenth ranked petroleum refining industry (SIC 2911) was no longer in the top 10 in 1982 (Table 4), where it had fallen to 23rd reflecting the decreased advertising rivalry of gasolines. Only five of the top 25 advertisers in 1967 did not reappear in the top 25 in 1982 and only one of these five was not still among the top 35 (SIC 2023, canned and evaporated milk).

The similarities between an industry's 1967 advertising and its 1982 level is captured by the simple correlation of 0.964 between the advertising levels of the two years. The correlation is still 0.962 if the 114 industries that had an advertising-to-sales ratio of 0.00 in both years are omitted. A very tight regression line exists between the advertising levels in 1982 and those in 1967 giving a  $R^2$  of 0.93 with or without the nonadvertising industries. The relative advertising levels by industries are very stable over this 15 year period.

Of the top 25 industry advertisers most had high advertising-to-sales (A/S) ratios. Of the top 10 advertisers in 1967, only two large industries (SICs 3711, motor vehicles, and 2911, petroleum refining) had A/S ratios of less than 3 percent (Table 5). Of the 15 industries ranked 11 to 25 in 1967, nine do not appear on the 1967 top 25 industries based on A/S ratios, but only two industries have a ratio of less than 1.0 percent. The toilet preparations industry (SIC 2844) was the leader in 1967 in both absolute advertising (Table 3) and based on A/S ratios in 1967, with an A/S ratio of 15.5 percent. Only three industries had ratios exceeding 10 percent and only 20 industries had ratios exceeding 3 percent. The mean A/S ratio for 1967 was 0.72 percent, but with 138 industries having an A/S ratio of 0.00 the mean is not a good measure of central tendency (the median is 0.01 percent). A better indicator of the 1967 distribution of industry A/S ratios is given in Table 7a. Nearly half (48.6 percent) of the 284 industries had an A/S ratio of 0.00 percent. Of those industries with a positive A/S ratio, 58 industries had A/S ratios between 0.01 and 0.25 and 44 more industries had A/S ratios exceeding .25 but under 1 percent. At the high end of the distribution, 24 industries had A/S ratios of at least 1.00 but less than 3 percent whereas 20 industries had ratios exceeding 3 percent, as was seen in Table 5.

The distribution of industries by their 1982 A/S ratios is remarkably similar to the 1967 distribution (Table 7b). The mean A/S ratio in 1982 was 0.66 percent, but again almost half (47.5 percent) of the industries had an A/S ratio of 0.00. Also, 20 industries had ratios exceeding 3 percent, and the majority of these 20 industries were the same as those found in 1967 (see Tables 5 and 6) but some changes took place. Eight of the top 25 industries, based on their A/S ratios in 1967, did not reappear on the 1982 top 25 list (Table 6). Only three of these industries fell dramatically in the rankings. Cigars (SIC 2121) fell from 14th in 1967 to 46th in 1982. Interestingly, the banning of cigarette advertising on television in the early 1970s did not displace the industry from the top 10 in 1982. The industry that suffered the largest fall in the rankings was condensed and evaporated milk (SIC 2023). Sewing machines also fell substantially from 25th to 48th place.

Although the stability of the relative rankings of industries by either their advertising totals or their A/S ratios is most apparent, it is interesting to examine the leading changes that took place over the 15 year period (Tables 8-11). Most of the industries that posted the largest increases in advertising expenditures were already the largest advertisers in 1967 (see Table 8). Toilet preparations had the largest absolute dollar increase, insuring its place as the largest advertiser in both years. The electronic computing equipment industry (SIC 3573) did increase from an almost nonadvertiser to nearly \$184 million in 1982, but that resulted in only a 0.50 percent A/S ratio. The chocolate industry also showed a large increase to a 1982 A/S of 6.08 percent, much of which is explained by the change of marketing philosophy at Hershey's where they went from a "word-of-mouth" approach to being a substantial media advertiser after their founder died.

The industries with the 25 largest dollar declines in advertising from 1967 to 1982 are listed in Table 9. Not surprisingly, the largest decline was in the condensed and evaporated milk industry, as busier consumers became less interested in baking preparations. Cigars was second on the list of the declining industry spenders. Only two of the top five declining advertisers were even modest advertisers in 1967, as most of the decreases came in industries that did not advertise intensely (had A/S ratios well under 1 percent). Seven industries even abandoned media advertising completely by 1982.

The changes are more meaningful when examining an industry's change in its A/S ratio, since it controls for inflation. First, recall that 114 industries had A/S ratios of 0.00 in both 1967 and 1982, thus at least 40 percent of the industries had no change in their advertising intensity. The 25 largest increases in A/S ratios, calculated by subtracting the 1967 ratio from the 1982 ratio (CAS) are given in Table 10. The largest increase was in the phonographic records and prerecorded tape industry as it posted a 5 point increase in its A/S ratio to a value of 13.3 in 1982. The chocolate industry was next, as it increased from 1.41 percent to 6.08 percent. The next eight largest increases ranged from nearly 4 points to just a one percentage point increase over their 1967 A/S ratio.

Even the industry with the 20th largest increase increased by less than a half of a percentage point, suggesting again that industry A/S ratios were reasonably constant over this 15 year period. Measuring a change in advertising intensity could also be done by calculating the percentage (as opposed to percentage point change) increase, as was done in the last column of Table 10 (% CAS). Of course, the largest increases came from industries that started at a very small positive A/S ratio and increased it to some higher level. By far the largest increase using this measure of change was in the fur goods industry (SIC 2371) which went from an A/S ratio of 0.06 percent in 1967 to 0.93 percent in 1982, for a 1,450 percentage increase, but only a 0.86 percentage point increase. The % CAS measure adds information but should only be used in addition to the simple percentage point change. It does raise the interesting question as to what amounts to a large increase in advertising intensity. If an industry increased its A/S from .05 percent to .25, is that comparable to an industry

that increased its A/S ratio from 1 percent to 5 percent? We contend that the latter industry had a much more significant increase in advertising.

There were also industries that decreased their A/S ratio over the period (Table 11). The largest percentage point decline came from the cereal industry, losing 6 percentage points to leave it a 1982 A/S ratio of slightly over 7 percent, or the sixth largest A/S in 1982. Most of the largest declines came from industries that were and still are considered substantial advertisers. Indeed, three of the top four declining industries still remained in the top 10 in terms of 1982 advertising intensity and the fourth slipped only to 13th place. The 25th largest decline came in with only a half of a percentage point change over the 15 year period. Hence, again the conclusion of relative stability emerges as 18 industries increased their A/S by a half of a percentage point or more and 24 industries decreased their A/S ratio by that much. The remaining 242 industries did not change by more than a half of a percentage point from their 1967 A/S ratio. The correlation between the A/S ratios in 1967 and 1982 was .88, and if you remove the 114 industries that had an A/S of 0.00 in both years, the correlation is slightly lower at .84. The regression fit between the two years' A/S ratios is very good, with the constant term being insignificantly different from zero and the estimated slope coefficient insignificantly different from one. These results hold with or without including the 114 industries that had zero A/S ratios in both 1967 and 1982.

## Conclusion

In conclusion, there was dramatic stability in the relative advertising levels and intensities by the 284 industries over the 1967 to 1982 period. Such stability suggests that Mueller and Rogers were correct in stating that any one year's A/S ratios should provide a relative ranking of industries along a product differentiation scale. The stability is remarkable, given that some movements should be expected with macroeconomic conditions and other short-term influences that could hit an industry. The best measure of advertising intensity would not use a single year's data but would average 3 to 5 years of data centered on the year of interest. This average should prove even more stable. In fact, the cereal industry has returned to its higher A/S ratio with its 1987 media A/S ratio at 12.9 percent, much closer to the 14.7 percent seen in 1967. If such movements are not uncommon, the stability observed in general among the 284 industries is even more impressive.

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Table 1. Example of Assigning SIC Codes to LNA Advertising Data from LNA F111 Product Code, Sugars, Syrups, and Artificial Sweeteners, 1987 (\$000)

SIC787	LNA	Sec SIC	Product	Company	Code	Total	Maga	Newsp	Nradio	Outdoor	Ntv	Stv	Cabletv
2869	F111		Nutrasweet Sweetener	Monsanto Co	0	20,407.7	263.5	0.0	0.0	1.9	20,041.9	100.4	0.0
2869	F111		Equal Sweetener	Monsanto Co	0	11,024.6	905.2	0.0	1,209.7	0.0	8,899.7	10.0	0.0
2869	F111		Sweet N Low Sugar Substitute	Cumberland Packing Corp	0	3,955.9	477.3	0.0	0.0	0.0	2,015.1	1,463.5	0.0
2869	F111		Necta Sweet Sugar Substitute	Goody's Manufacturing Corp	0	88.1	88.1	0.0	0.0	0.0	0.0	0.0	0.0
2099G51	F111	20993	Karo Syrup & WCP Pectin	CPC International Inc	2	18.0	18.0	0.0	0.0	0.0	0.0	0.0	0.0
2099G25	F111		Sue Bee Honey	Sioux Honey Assn	0	264.9	165.8	0.0	8.6	0.0	0.0	0.0	90.5
2099G25	F111		Sue Bee Honey & Spread	Sioux Honey Assn	0	66.9	66.9	0.0	0.0	0.0	0.0	0.0	0.0
2099G25	F111		Golden Blossom Honey	Paton John Inc	0	23.3	0.0	23.3	0.0	0.0	0.0	0.0	0.0
2099G25	F111		Cucamonga Honey	Western Commerce Corp	0	14.4	14.4	0.0	0.0	0.0	0.0	0.0	0.0
2099G25	F111		Sue Bee Spun Honey Spread	Sioux Honey Assn	0	4.9	0.0	0.0	4.9	0.0	0.0	0.0	0.0
20993	F111		Mrs. Butterworths Syrups	Unilever NV	0	6,014.7	0.0	0.0	0.0	0.0	4,320.2	1,635.0	59.5
20993	F111		Aunt Jemima Lite Syrup	Quaker Oats Co	0	3,849.0	4.9	0.0	0.0	0.0	3,533.7	223.9	86.5
20993	F111		Log Cabin Syrups	Philip Morris Companies Inc	0	1,604.6	107.0	0.0	0.0	0.0	1,354.9	73.7	69.0
20993	F111		Aunt Jemima Lite & Butterlite Syrup	Quaker Oats Co	0	837.1	837.1	0.0	0.0	0.0	0.0	0.0	0.0
20993	F111		Golden Griddle Pancake Syrup	CPC International Inc	0	702.6	700.6	0.0	0.0	0.0	0.0	0.0	2.0
20993	F111		Karo Syrup	CPC International Inc	0	266.0	266.0	0.0	0.0	0.0	0.0	0.0	0.0
20993	F111	20669	Karo Syrup & Bakers Chocolate	CPC International Inc	1	190.9	190.9	0.0	0.0	0.0	0.0	0.0	0.0
20993	F111		Maple Rich Syrup	zz Company Unknown	0	76.1	0.0	0.0	0.0	0.0	0.0	76.1	0.0
20993	F111		Griffin Syrup	Griffin Mfg Co	0	44.8	0.0	0.0	0.0	0.0	0.0	44.8	0.0
20993	F111		North Country Maple Syrup	North Country Corp	0	34.7	34.7	0.0	0.0	0.0	0.0	0.0	0.0
20993	F111		Grandmas Molasses	Cadbury Schweppes PLC	0	33.6	33.6	0.0	0.0	0.0	0.0	0.0	0.0
20993	F111	2041506	Aunt Jemima Lite Syrup & Pancake Mix	Quaker Oats Co	1	18.0	18.0	0.0	0.0	0.0	0.0	0.0	0.0
20993	F111	2099G51	Karo Syrup & WCP Pectin	CPC International Inc	1	18.0	18.0	0.0	0.0	0.0	0.0	0.0	0.0
20993	F111		Log Cabin Lite Syrup	Philip Morris Companies Inc	0	17.7	0.0	0.0	0.0	0.0	0.0	16.0	1.7
20993	F111		Mrs. Butterworths Lite Syrup	Unilever NV	0	0.5	0.0	0.0	0.0	0.0	0.0	0.5	0.0
20993	F111	2041506	Mrs. Butterworths Syrup & Pancake Mix	Unilever NV	1	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.0
2066992	F111		Hersheys Chocolate Syrup	Hershey Food Corp	0	4,612.4	1,136.7	0.0	0.0	274.8	1,536.9	1,664.0	0.0
20669	F111	20993	Karo Syrup & Bakers Chocolate	CPC International Inc	2	190.9	190.9	0.0	0.0	0.0	0.0	0.0	0.0
20623	F111		C & H Sugar	Alexander & Baldwin Inc	0	3,677.6	292.4	0.0	0.0	0.0	0.0	3,385.2	0.0
20623	F111		Imperial Sugar	Imperial Sugar	0	407.6	0.0	0.0	0.0	0.0	0.0	407.6	0.0
20623	F111		Domino Sugar	Amstar Corp	0	326.4	259.7	66.7	0.0	0.0	0.0	0.0	0.0
20623	F111		Domino Light Brown Sugar	Amstar Corp	0	129.5	129.5	0.0	0.0	0.0	0.0	0.0	0.0
20623	F111		Dixie Crystal Sugar	Savannah Foods & Industries Inc	0	98.1	72.2	0.0	0.0	25.9	0.0	0.0	0.0
20623	F111		Dixie Crystal Brown Sugar	Savannah Foods & Industries Inc	0	94.6	94.6	0.0	0.0	0.0	0.0	0.0	0.0
20623	F111		Pioneer Sugar	Savannah Foods & Industries Inc	0	21.0	21.0	0.0	0.0	0.0	0.0	0.0	0.0
2041506	F111	20993	Aunt Jemima Lite Syrup & Pancake Mix	Quaker Oats Co	2	18.0	18.0	0.0	0.0	0.0	0.0	0.0	0.0
2041506	F111	20993	Mrs. Butterworths Syrup & Pancake Mix	Unilever NV	2	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.0
Media Totals for F111						59,153.3	6,425.0	90.0	1,223.2	302.6	41,702.4	9,100.9	309.2



Table 2. A Comparison of Two Alternative Advertising Data Sources for Selected U.S. Food Industries, 1972

SIC Code and Industry	Data Source							
	Input—Output				LNA—Rogers			
	Total <sup>1</sup>	Network TV	Spot TV	Magazines	Total <sup>2</sup>	Network TV	Spot TV	Magazines
	- Millions -				- Millions -			
2023 Canned Milk	31.3	0.7	1.9	0.7	14.1	5.5	3.7	4.5
2026 Milk and Related Products	57.6	3.0	9.9	2.1	9.4	0.2	8.6	0.4
2032 Canned Specialties	105.1	9.2	7.9	11.9	37.0	19.4	8.7	7.1
2035 Pickles, Sauces, Dressings	87.3	24.3	19.2	13.9	28.0	11.4	7.8	7.9
2044 Rice	8.4	0.0	0.0	0.0	6.5	0.4	3.1	2.7
2051 Bread and Rolls	90.3	23.1	25.5	11.5	35.7	9.5	21.2	2.4
2067 Chewing Gum	16.6	4.2	5.3	0.3	36.9	10.3	25.4	0.6
2087 Flavorings	13.1	0.6	0.3	1.9	14.9	9.5	2.9	1.9
2092 Canned Fish	7.5	2.3	1.7	1.2	1.1	0.4	0.5	0.2
2098 Pasta Products	8.8	0.6	0.7	0.6	16.6	7.6	4.9	3.6

<sup>1</sup>The I-O total includes many more forms of advertising than the LNA total, but only three comparable individual media are listed here.

<sup>2</sup>The LNA total is comprised of six measured media: magazines, newspaper supplements, network and spot television, network radio and outdoor. See text for more detailed information.

Source: Rogers, 1982, page 112.

Table 3. The Leading 25 Industries, by 1967 Total Measured Media Advertising

Rank	SIC	Name	A67	A82	AS67	AS82
			(\$000)		percent	
1	2844	TOILET PREPARATIONS	389,351	1,120,578	15.48	11.00
2	3711	MOTOR VEHICLES: CAR	328,917	1,018,907	1.20	1.44
3	2834	PHARMACEUTICAL	285,901	710,595	6.08	3.74
4	2111	CIGARETTES	266,264	610,224	8.74	5.03
5	2841	SOAP: OTHER DETERGENTS	207,225	373,048	7.99	4.06
6	2085	DISTILLED LIQUOR, EXCEPT	130,485	283,179	9.56	9.05
7	2086	BOTTLED AND CANNED SOFT	113,638	238,601	3.58	1.41
8	2082	MALT BEVERAGES 4 DIGIT	111,123	414,296	3.79	3.70
9	2043	CEREAL BREAKFAST FOODS	106,299	291,743	13.40	7.06
10	2911	PETROLEUM REFINERY	95,550	91,587	0.47	0.04
11	2647	SANITARY PAPER PRODUCTS	54,894	179,659	4.24	1.97
12	2079	SHORTENING AND COOKING	53,119	90,896	3.07	1.85
13	2095	COFFEE 4 DIGIT DATA	50,390	190,421	2.40	3.26
14	3651	RADIO: TV RECEIVING	48,474	129,160	1.26	2.13
15	2032	CANNED SPECIALTIES	45,924	74,152	3.37	1.79
16	3011	TIRES: INNER TUBES	45,522	72,225	1.21	0.77
17	2033	CANNED FRUITS AND	43,777	129,176	1.26	1.39
18	2065	CONFECTIONERY PRODUCTS	43,314	96,868	2.31	1.43
19	3861	PHOTOGRPAHIC EQUIP AND	42,933	229,765	1.17	1.34
20	2051	BREAD, CAKE, AND RELATED	37,557	72,049	0.73	0.54
21	2023	CONDENSED AND EVAPORATED	36,852	10,876	2.91	0.22
22	2067	CHEWING GUM AND CHEWING	36,037	110,910	11.89	12.12
23	2731	BOOK PUBLISHING	33,483	101,478	1.56	1.31
24	3634	ELECTRONIC HOUSEWARES	30,518	53,001	2.74	1.67
25	2011	MEAT PACKING PLANTS	23,901	60,368	0.15	0.13

where: A67 (82) is total media advertising for 1967 (1982).  
AS67 (82) is media advertising-to-sales ratio for 1967 (1982).

Table 4. The Leading 25 Industries, by 1982 Total Measured Media Advertising

Rank	SIC	Name	A67	A82	AS67	AS82
			(\$000)		percent	
1	2844	TOILET PREPARATIONS	389,351	1,120,578	15.48	11.00
2	3711	MOTOR VEHICLES: CAR	328,917	1,018,907	1.20	1.44
3	2834	PHARMACEUTICAL	285,901	710,595	6.08	3.74
4	2111	CIGARETTES	266,264	610,224	8.74	5.03
5	2082	MALT BEVERAGES 4 DIGIT	111,123	414,296	3.79	3.70
6	2841	SOAP: OTHER DETERGENTS	207,225	373,048	7.99	4.06
7	2043	CEREAL BREAKFAST FOODS	106,299	291,743	13.40	7.06
8	2085	DISTILLED LIQUOR, EXCEPT	130,485	283,179	9.56	9.05
9	2086	BOTTLED AND CANNED SOFT	113,638	238,601	3.58	1.41
10	3652	PHONO RECORDS, RECORD	22,517	235,689	8.15	13.33
11	3861	PHOTOGRAPHIC EQUIP AND	42,933	229,765	1.17	1.34
12	2095	COFFEE 4 DIGIT DATA	50,390	190,421	2.40	3.26
13	3573	ELECTRIC COMPUTING EQUIP	3,074	184,814	0.08	0.50
14	2084	WINES, BRANDY, AND	20,988	182,532	5.11	6.55
15	2647	SANITARY PAPER PRODUCTS	54,894	179,659	4.24	1.97
16	2721	PERIODICALS	15,971	149,031	0.51	1.29
17	2066	CHOCOLATE AND COCOA	7,341	134,924	1.41	6.08
18	2033	CANNED FRUITS AND	43,777	129,176	1.26	1.39
19	3651	RADIO: TV RECEIVING	48,474	129,160	1.26	2.13
20	2067	CHEWING GUM AND CHEWING	36,037	110,910	11.89	12.12
21	2731	BOOK PUBLISHING	33,483	101,478	1.56	1.31
22	2065	CONFECTIONERY PRODUCTS	43,314	96,868	2.31	1.43
23	2911	PETROLEUM REFINERY	95,550	91,587	0.47	0.04
24	2079	SHORTENING AND COOKING	53,119	90,896	3.07	1.85
25	2032	CANNED SPECIALTIES	45,924	74,152	3.37	1.79

Table 5. The Leading 25 Industries, by 1967 Advertising-to-Sales Ratios

Rank	SIC	Name	A67	A82	AS67	AS82
			(\$000)		percent	
1	2844	TOILET PREPARATIONS	389,351	1,120,578	15.48	11.00
2	2043	CEREAL BREAKFAST FOODS	106,299	291,743	13.40	7.06
3	2067	CHEWING GUM AND CHEWING	36,037	110,910	11.89	12.12
4	2085	DISTILLED LIQUOR, EXCEPT	130,485	283,179	9.56	9.05
5	2111	CIGARETTES	266,264	610,224	8.74	5.03
6	3652	PHONO RECORDS, RECORD	22,517	235,689	8.15	13.33
7	2841	SOAP: OTHER DETERGENTS	207,225	373,048	7.99	4.06
8	3942	DOLLS: STUFFED TOYS	12,683	33,238	7.82	8.39
9	3421	CUTLERY	23,139	33,949	6.12	3.61
10	2834	PHARMACEUTICAL	285,901	710,595	6.08	3.74
11	2084	WINES, BRANDY, AND	20,988	182,532	5.11	6.55
12	3996	HARD SURFACE FLOOR	10,651	18,744	4.81	3.10
13	2098	MACARONI, SPAGHETTI, AND	11,804	23,297	4.43	2.18
14	2121	CIGARS	15,940	2,589	4.39	1.02
15	2647	SANITARY PAPER PRODUCTS	54,894	179,659	4.24	1.97
16	2082	MALT BEVERAGES 4 DIGIT	111,123	414,296	3.79	3.70
17	2086	BOTTLED AND CANNED SOFT	113,638	238,601	3.58	1.41
18	2032	CANNED SPECIALTIES	45,924	74,152	3.37	1.79
19	2079	SHORTENING AND COOKING	53,119	90,896	3.07	1.85
20	2342	BRASSIERES: ALLIED	20,287	20,374	3.05	2.82
21	2131	CHEWING AND SMOKING	3,628	16,725	2.97	2.51
22	2023	CONDENSED AND EVAPORATED	36,852	10,876	2.91	0.22
23	2034	DEHYDRATED FRUITS	12,039	25,338	2.86	1.45
24	3634	ELECTRIC HOUSEWARES	30,518	53,001	2.74	1.67
25	3636	SEWING MACHINES	3,113	2,897	2.53	0.96

where: A67 (82) is total media advertising for 1967 (1982).  
AS67 (82) is media advertising-to-sales ratio for 1967 (1982).

Table 6. The Leading 25 Industries, by 1982 Advertising-to-Sales Ratios

Rank	SIC	Name	A67	A82	AS67	AS82
			(\$000)		percent	
1	3652	PHONO RECORDS, RECORD	22,517	235,689	8.15	13.33
2	2067	CHEWING GUM AND CHEWING	36,037	110,910	11.89	12.12
3	2844	TOILET PREPARATIONS	389,351	1,120,578	15.48	11.00
4	2085	DISTILLED LIQUOR, EXCEPT	130,485	283,179	9.56	9.05
5	3942	DOLLS: STUFFED TOYS	12,683	33,238	7.82	8.39
6	2043	CEREAL BREAKFAST FOODS	106,299	291,743	13.40	7.06
7	2084	WINES, BRANDY, AND	20,988	182,532	5.11	6.55
8	2066	CHOCOLATE AND COCOA	7,341	134,924	1.41	6.08
9	2111	CIGARETTES	266,264	610,224	8.74	5.03
10	3262	VITREOEUS: PORCELAIN	1,650	10,649	2.46	4.41
11	2251	WOMEN HOSIERY, EXCEPT	5,494	62,045	0.65	4.39
12	3692	PRIMARY BATTERIES, DRY	2,695	46,707	0.87	4.24
13	2841	SOAP: OTHER DETERGENTS	207,225	373,048	7.99	4.06
14	3751	MOTORCYCLES, BICYCLES	3,678	52,546	1.23	3.91
15	2322	MENS, BOYS, UNDERWEAR	2,563	16,678	1.42	3.88
16	2834	PHARMACEUTICAL	285,901	710,595	6.08	3.74
17	2082	MALT BEVERAGES 4 DIGIT	111,123	414,296	3.79	3.70
18	3421	CUTLERY	23,139	33,949	6.12	3.61
19	2095	COFFEE 4 DIGIT DATA	50,390	190,421	2.40	3.26
20	3996	HARD SURFACE FLOOR	10,651	18,744	4.81	3.10
21	2342	BRASSIERES: ALLIED	20,287	20,374	3.05	2.82
22	2131	CHEWING AND SMOKING	3,628	16,725	2.97	2.51
23	2098	MACARONI, SPAGHETTI, AND	11,804	23,297	4.43	2.18
24	3651	RADIO: TV RECEIVING	48,474	129,160	1.26	2.13
25	2647	SANITARY PAPER PRODUCTS	54,894	179,659	4.24	1.97

Table 7a. Distribution of Measured Media Advertising-to-Sales Ratios, 1967

A/S (%)	Number of SICs	Percent of Total	Cumulative Number	Cumulative Percent
= 0.00	138	48.6	138	48.6
.01 to .24	58	20.4	196	69.0
.25 to .99	44	15.5	240	84.5
1.00 to 2.99	24	8.5	264	93.0
3.00 and higher	20	7.0	284	100.0

Table 7b. Distribution of Measured Media Advertising-to-Sales Ratios, 1982

A/S (%)	Number of SICs	Percent of Total	Cumulative Number	Cumulative Percent
= 0.00	135	47.5	135	47.5
.01 to .24	68	23.9	203	71.5
.25 to .99	35	12.3	238	83.8
1.00 to 2.99	26	9.2	264	93.0
3.00 and higher	20	7.0	284	100.0

Table 8. The Twenty-Five Largest Increases in Industry Advertising, 1967-82

Rank	SIC	Name	A67	A82	Change
					(\$000)
1	2844	TOILET PREPARATIONS	389,351	1,120,578	731,227
2	3711	MOTOR VEHICLES: CAR	328,917	1,018,907	689,990
3	2834	PHARMACEUTICAL	285,901	710,595	424,694
4	2111	CIGARETTES	266,264	610,224	343,960
5	2082	MALT BEVERAGES 4 DIGIT	111,123	414,296	303,173
6	3652	PHONO RECORDS, RECORD	22,517	235,689	213,172
7	3861	PHOTOGRAPHIC EQUIP AND	42,933	229,765	186,832
8	2043	CEREAL BREAKFAST FOODS	106,299	291,743	185,444
9	3573	ELECTRIC COMPUTING EQUIP	3,074	184,814	181,740
10	2841	SOAP: OTHER DETERGENTS	207,225	373,048	165,823
11	2084	WINES, BRANDY, AND	20,988	182,532	161,544
12	2085	DISTILLED LIQUOR, EXCEPT	130,485	283,179	152,694
13	2095	COFFEE 4 DIGIT DATA	50,390	190,421	140,031
14	2721	PERIODICALS	15,971	149,031	133,060
15	2066	CHOCOLATE AND COCOA	7,341	134,924	127,583
16	2086	BOTTLED AND CANNED SOFT	113,638	238,601	124,963
17	2647	SANITARY PAPER PRODUCTS	54,894	179,659	124,765
18	2033	CANNED FRUITS AND	43,777	129,176	85,399
19	3651	RADIO: TV RECEIVING	48,474	129,160	80,686
20	2067	CHEWING GUM AND CHEWING	36,037	110,910	74,873
21	2731	BOOK PUBLISHING	33,483	101,478	67,995
22	2251	WOMEN HOSIERY, EXCEPT	5,494	62,045	56,551
23	2065	CONFECTIONERY PRODUCTS	43,314	96,868	53,554
24	3751	MOTORCYCLES, BICYCLES	3,678	52,546	48,868
25	2022	CHEESE, NATURAL AND	12,252	61,062	48,810

where: A67 (82) is total media advertising for 1967 (1982).

Table 9. The Twenty-Five Largest Declines in Industry Advertising, 1967-82

Rank	SIC	Name	A67	A82	Change
					(\$000)
1	2023	CONDENSED AND EVAPORATED	36,852	10,876	-25,976
2	2121	CIGARS	15,940	2,589	-13,351
3	3632	HOUSEHOLD REFRIGERATORS	8,925	4,023	-4,902
4	2911	PETROLEUM REFINERY	95,550	91,587	-3,963
5	2321	MENS: BOYS SHIRTS	8,033	4,699	-3,334
6	2843	SURFACE ACTIVE:	2,827	0	-2,827
7	2272	TUFTED CARPETS: RUGS	4,058	1,669	-2,389
8	2295	COATED FABRICS, NOT	2,160	0	-2,160
9	3211	FLAT GLASS	1,577	59	-1,518
10	2385	RAINCOATS: OTHER	1,537	47	-1,490
11	2252	HOSIERY, N.E.C.	2,465	1,089	-1,376
12	2091	CANNED AND CURED SEAFOOD	9,289	8,329	-960
13	3964	NEEDLES, PINS	1,494	551	-943
14	2831	BIOLOGICAL PRODUCTS	773	0	-773
15	3315	STEEL WIRE AND RELATEDL	692	3	-689
16	3361	ALUMINUM CASTINGS	764	136	-628
17	3562	BALL: ROLLER BEARINGS	699	195	-504
18	2062	REFINED CANE SUGAR AND	2,440	1,939	-501
19	2363	CHILDRENS COATS: SUITS	726	246	-480
20	2761	MANIFOLD BUSINESS FORMS	423	0	-423
21	2654	SANITARY FOOD CONTAINERS	2,390	1,998	-392
22	2861	GUM: WOOD CHEMICALS	376	0	-376
23	2653	CORRUGATED: SOLID FIBER	295	0	-295
24	2231	WEAVING: FINISHING	256	0	-256
25	2361	CHILDRENS DRESSES	511	265	-246



Table 10. The Twenty-Five Largest Increases in Industry Advertising-to-Sales Ratios, 1967-82

Rank	SIC	Name	AS67	AS82	CAS	% CAS
			percent		change	% change
1	3652	PHONO RECORDS, RECORD	8.15	13.33	5.17	63.56
2	2066	CHOCOLATE AND COCOA	1.41	6.08	4.67	331.21
3	2251	WOMEN HOSIERY, EXCEPT	0.65	4.39	3.73	575.38
4	3692	PRIMARY BATTERIES, DRY	0.87	4.24	3.36	387.36
5	3751	MOTORCYCLES, BICYCLES	1.23	3.91	2.68	217.89
6	2322	MENS, BOYS, UNDERWEAR	1.42	3.88	2.46	173.24
7	3262	VITREOUS: PORCELAIN	2.46	4.41	1.95	79.27
8	2084	WINES, BRANDY, AND	5.11	6.55	1.43	28.18
9	3851	OPHTHALMIC GOODS	0.47	1.70	1.22	261.70
10	3635	HOUSEHOLD VACUUM	0.87	1.87	0.99	114.94
11	2371	FUR GOODS	0.06	0.93	0.86	1,450.00
12	3651	RADIO: TV RECEIVING	1.26	2.13	0.86	69.05
13	2095	COFFEE 4 DIGIT DATA	2.40	3.26	0.85	35.83
14	2721	PERIODICALS	0.51	1.29	0.78	152.94
15	2771	GREETING CARD PUBLISHING	0.47	1.24	0.77	163.83
16	2271	WOVEN CARPETS: RUGS	0.10	0.76	0.66	660.00
17	3991	BROOMS: BRUSHES	0.30	0.93	0.62	210.00
18	3942	DOLLS: STUFFED TOYS	7.82	8.39	0.56	7.29
19	3432	PLUMBING FIXTURE	0.11	0.57	0.46	418.18
20	2328	MENS: BOYS WORK	0.04	0.49	0.44	1,125.00
21	2515	MATTRESSES: BEDSPRINGS	0.95	1.40	0.44	47.37
22	3263	EARTHENWARE SEMIVITREOUS	1.29	1.72	0.42	33.33
23	3573	ELECTRIC COMPUTING EQUIP	0.08	0.50	0.42	525.00
24	2643	BAGS, EXCEPT TEXTILE	0.43	0.84	0.41	95.35
25	3295	MINERALS: EARTHS	0.00	0.40	0.40	—

where: AS67 (82) is media advertising-to-sales ratio for 1967 (1982).  
CAS = AS82 - AS67 and % CAS = (CAS/AS67) \* 100.

Table 11. The Twenty-Five Largest Decreases in Industry Advertising-to-Sales Ratios, 1967-82

Rank	SIC	Name	AS67	AS82	CAS	% CAS
			percent		change	% change
1	2043	CEREAL BREAKFAST FOODS	13.40	7.06	-6.34	-47.31
2	2844	TOILET PREPARATIONS	15.48	11.00	-4.47	-28.94
3	2841	SOAP: OTHER DETERGENTS	7.99	4.06	-3.92	-49.19
4	2111	CIGARETTES	8.74	5.03	-3.71	-42.45
5	2121	CIGARS	4.39	1.02	-3.36	-76.77
6	2023	CONDENSED AND EVAPORATED	2.91	0.22	-2.68	-92.44
7	3421	CUTLERY	6.12	3.61	-2.50	-41.01
8	2843	PHARMACEUTICAL	6.08	3.74	-2.34	-38.49
9	2647	SANITARY PAPER PRODUCTS	4.24	1.97	-2.26	-53.54
10	2098	MACARONI, SPAGHETTI, AND	4.43	2.18	-2.25	-50.79
11	2086	BOTTLED AND CANNED SOFT	3.58	1.41	-2.16	-60.61
12	3996	HARD SURFACE FLOOR	4.81	3.10	-1.71	-35.55
13	2032	CANNED SPECIALTIES	3.37	1.79	-1.58	-46.88
14	3636	SEWING MACHINES	2.53	0.96	-1.56	-62.06
15	2034	DEHYDRATED FRUITS	2.86	1.45	-1.41	-49.30
16	2091	CANNED AND CURED SEAFOOD	1.77	0.45	-1.32	-74.58
17	2079	SHORTENING AND COOKING	3.07	1.85	-1.22	-39.74
18	3634	ELECTRIC HOUSEWARES	2.74	1.67	-1.06	-39.05
19	2843	SURFACE ACTIVE	0.96	0.00	-0.96	-100.00
20	2065	CONFECTIONERY PRODUCTS	2.31	1.43	-0.88	-38.10
21	2044	MILLED RICE AND	1.39	0.87	-0.52	-37.41
22	3842	SURGICAL APPLIANCES	1.02	0.50	-0.52	-50.98
23	2085	DISTILLED LIQUOR, EXCEPT	9.56	9.05	-0.50	-5.33
24	3172	PERSONAL LEATHER GOODS	1.04	0.54	-0.50	-48.08
25	2831	BIOLOGICAL PRODUCTS	0.48	0.00	-0.48	-100.00

Appendix Table 1. Listing of the LNA Advertising Data for 284 Industries, by SIC

A67 = Total advertising in thousands of dollars, 1967  
 A82 = Total advertising in thousands of dollars, 1982  
 AS67 = Total advertising-to-sales ratio in percent, 1967  
 AS82 = Total advertising-to-sales ratio in percent, 1982

ROW	SIC	NAME	A67	A82	AS67	AS82
1	2011	MEAT PACKING PLANTS	23,901	60,368	0.15	0.13
2	2013	SAUSAGES AND PREPARED	4,553	16,042	0.15	0.13
3	2022	CHEESE, NATURAL AND	12,252	61,062	0.71	0.56
4	2023	CONDENSED AND EVAPORATED	36,852	10,876	2.91	0.22
5	2024	ICE CREAM AND ICES	7,020	27,788	0.66	0.97
6	2026	FLUID MILK	9,406	19,543	0.12	0.10
7	2032	CANNED SPECIALTIES	45,924	74,152	3.37	1.79
8	2033	CANNED FRUITS AND	43,777	129,176	1.26	1.39
9	2034	DEHYDRATED FRUITS	12,039	25,338	2.86	1.45
10	2041	FLOUR AND OTHER GRAIN	19,181	52,379	0.77	1.06
11	2043	CEREAL BREAKFAST FOODS	106,299	291,743	13.40	7.06
12	2044	MILLED RICE AND	7,658	16,935	1.39	0.87
13	2045	BLENDED AND PREPARED	4,202	14,774	0.76	1.04
14	2046	WET CORN MILLING	2,285	10,498	0.30	0.32
15	2051	BREAD, CAKE, AND RELATED	37,557	72,049	0.73	0.54
16	2052	COOKIES AND CRACKERS	23,241	58,281	1.69	1.24
17	2061	SUGAR CANE MILL PRODUCTS	0	0	0.00	0.00
18	2062	REFINED CANE SUGAR AND	2,440	1,939	0.17	0.06
19	2063	BEET SUGAR	996	999	0.17	0.06
20	2065	CONFECTIONERY PRODUCTS	43,314	96,868	2.31	1.43
21	2066	CHOCOLATE AND COCOA	7,341	134,924	1.41	6.08
22	2067	CHEWING GUM AND CHEWING	36,037	110,910	11.89	12.12
23	2074	COTTONSEED OIL MILL	0	0	0.00	0.00
24	2075	SOYBEAN OIL MILL	0	0	0.00	0.00
25	2076	VEGETABLE OIL MILL	0	0	0.00	0.00
26	2077	ANIMAL AND MARINE FATS	0	0	0.00	0.00
27	2079	SHORTENING AND COOKING	53,119	90,896	3.07	1.85
28	2082	MALT BEVERAGES 4 DIGIT	111,123	414,296	3.79	3.70
29	2083	MALT AND MALT BYPRODUCTS	0	0	0.00	0.00
30	2084	WINES, BRANDY, AND	20,988	182,532	5.11	6.55
31	2085	DISTILLED LIQUOR, EXCEPT	130,485	283,179	9.56	9.05
32	2086	BOTTLED AND CANNED SOFT	113,638	238,601	3.58	1.41
33	2091	CANNED AND CURED SEAFOOD	9,289	8,329	1.77	0.45
34	2095	COFFEE 4 DIGIT DATA	50,390	190,421	2.40	3.26
35	2097	MANUFACTURED ICE	0	73	0.00	0.03
36	2098	MACARONI, SPAGHETTI, AND	11,804	23,297	4.43	2.18
37	2111	CIGARETTES	266,264	610,224	8.74	5.03
38	2121	CIGARS	15,940	2,589	4.39	1.02
39	2131	CHEWING AND SMOKING	3,628	16,725	2.97	2.51

ROW	SIC	NAME	A67	A82	AS67	AS82
40	2141	TOBACCO STEMMING AND	0	0	0.00	0.00
41	2211	WEAVING MILLS, COTTON	3,508	4,039	0.10	0.10
42	2221	WEAVING MILLS, MANMADE	170	1,309	0.00	0.01
43	2231	WEAVING: FINISHING	256	0	0.02	0.00
44	2241	NARROW FABRIC MILLS	0	19	0.00	0.00
45	2251	WOMEN HOSIERY, EXCEPT	5,494	62,045	0.65	4.39
46	2252	HOSIERY, N.E.C.	2,465	1,089	0.44	0.07
47	2253	KNIT OUTERWEAR MILLS	82	860	0.00	0.02
48	2254	KNIT UNDERWEAR MILLS	0	0	0.00	0.00
49	2261	FINISHING PLANTS, COTTON	0	0	0.00	0.00
50	2262	FINISHING PLANTS, MANMADE	0	0	0.00	0.00
51	2271	WOVEN CARPETS: RUGS	249	1,669	0.10	0.76
52	2272	TUFTED CARPETS: RUGS	4,058	1,669	0.28	0.03
53	2281	YARN MILLS EXCEPT WOOL	0	0	0.00	0.00
54	2283	WOOL YARN MILLS	0	0	0.00	0.00
55	2284	THREAD	24	0	0.00	0.00
56	2291	PRESSED, PUNCHED, OR	0	0	0.00	0.00
57	2292	LACE: NET GOODS	2	0	0.00	0.00
58	2293	PADDING: UPHOLSTERY	22	64	0.01	0.02
59	2294	PROCESSED TEXTILE WASTE	0	0	0.00	0.00
60	2295	COATED FABRICS, NOT	2,160	0	0.35	0.00
61	2296	TIRE CORD: TIRE FABRICS	120	2	0.02	0.00
62	2298	CORDAGE: TWINE	8	.625	0.00	0.17
63	2311	MENS: BOYS SUITS	3,583	6,630	0.18	0.21
64	2321	MENS: BOYS SHIRTS	8,033	4,699	0.55	0.13
65	2322	MENS, BOYS, UNDERWEAR	2,563	16,678	1.42	3.88
66	2323	MENS, BOYS, YOUTHS	407	370	0.28	0.11
67	2327	MENS: BOYS SEPARATE	3,014	4,576	0.26	0.21
68	2328	MENS: BOYS WORK	517	22,881	0.04	0.49
69	2331	WOMENS: MISSES BLOUSES	465	1,641	0.06	0.04
70	2335	WOMENS: MISSES DRESSES	5,072	12,158	0.16	0.26
71	2337	WOMENS: MISSES SUITS	4,089	5,545	0.23	0.11
72	2341	WOMENS: CHILDRENS	2,289	8,532	0.20	0.32
73	2342	BRASSIERES: ALLIED	20,287	20,374	3.05	2.82
74	2351	MILLINERY	0	17	0.00	0.01
75	2352	HATS: CAPS, EXCEPT	139	677	0.07	0.15
76	2361	CHILDRENS DRESSES	511	265	0.10	0.01
77	2363	CHILDRENS COATS: SUITS	726	246	0.41	0.12
78	2371	FUR GOODS	230	3,897	0.06	0.93
79	2381	FABRIC DRESS: WORK	1,050	1,322	0.59	0.63
80	2384	ROBES: DRESSING GOWNS	39	543	0.01	0.13
81	2385	RAINCOATS: OTHER	1,537	47	0.41	0.00
82	2386	LEATHER: SHEEP LINED	24	27	0.02	0.01
83	2387	APPAREL BELTS	0	309	0.00	0.05
84	2391	CURTAINS: DRAPERIES	43	1,233	0.01	0.11
85	2392	OTHER HOUSE FURNISHINGS	0	10,831	0.00	0.33

ROW	SIC	NAME	A67	A82	AS67	AS82
86	2393	TEXTILE BAGS, EXC	0	18	0.00	0.00
87	2394	CANVAS PRODUCTS	144	635	0.05	0.08
88	2395	PLEATING: STITCHING	0	0	0.00	0.00
89	2396	AUTOMOTIVE: APPAREL	0	390	0.00	0.01
90	2397	SCHIFFLI MACHINE	0	0	0.00	0.00
91	2411	LOGGING CAMPS: LOGGING	0	0	0.00	0.00
92	2421	SAWMILLS: PLANING	0	245	0.00	0.00
93	2441	NAILED WOOD BOXES	0	0	0.00	0.00
94	2491	WOOD PRESERVING	0	0	0.00	0.00
95	2514	METAL HOUSEHOLD	708	925	0.11	0.05
96	2515	MATTRESSES: BEDSPRINGS	7,140	27,186	0.95	1.40
97	2521	WOOD OFFICE FURNITURE	112	639	0.07	0.05
98	2522	METAL OFFICE FURNITURE	1,673	1,581	0.26	0.05
99	2531	PUBLIC BLDG: OTHER	0	0	0.00	0.00
100	2541	WOOD PARTITIONS	0	18	0.00	0.00
101	2542	METAL PARTITIONS	42	30	0.00	0.00
102	2591	DRAPERY HARDWARE	850	3,565	0.34	0.32
103	2641	PAPER COATING: GLAZING	3,021	16,570	0.19	0.30
104	2642	ENVELOPES, ALL TYPES	0	4	0.00	0.00
105	2643	BAGS, EXCEPT TEXTILE	5,929	42,472	0.43	0.84
106	2645	DIE-CUT PAPER: BOARD	120	11	0.02	0.00
107	2646	PRESSED: MOLDED PULP	0	0	0.00	0.00
108	2647	SANITARY PAPER PRODUCTS	54,894	179,659	4.24	1.97
109	2651	BENDING PAPERBOARD	10	0	0.00	0.00
110	2652	SETUP PAPERBOARD BOXES	0	0	0.00	0.00
111	2653	CORRUGATED: SOLID FIBER	295	0	0.00	0.00
112	2654	SANITARY FOOD CONTAINERS	2,390	1,998	0.21	0.07
113	2655	FIBER CANS, DRUMS	0	0	0.00	0.00
114	2661	BLDG PAPER: BOARD MILLS	45	0	0.01	0.00
115	2711	NEWSPAPERS	4,603	38,513	0.07	0.18
116	2721	PERIODICALS	15,971	149,031	0.51	1.29
117	2731	BOOK PUBLISHING	33,483	101,478	1.56	1.31
118	2732	BOOK PRINTING	0	0	0.00	0.00
119	2741	MISCELLANEOUS PUBLISHING	3,018	6,446	0.49	0.22
120	2753	ENGRAVING: PLATE	0	0	0.00	0.00
121	2761	MANIFOLD BUSINESS FORMS	423	0	0.04	0.00
122	2771	GREETING CARD PUBLISHING	2,431	23,560	0.47	1.24
123	2782	BLANKBOOKS: LOOSELEAF	106	2,185	0.02	0.10
124	2789	BOOKBINDING: RELATED	0	0	0.00	0.00
125	2791	TYPESETTING	0	0	0.00	0.00
126	2812	ALKALIES: CHLORINE	1,215	3,075	0.16	0.19
127	2813	INDUSTRIAL GASES	0	0	0.00	0.00
128	2816	INORGANIC PIGMENTS	0	0	0.00	0.00
129	2822	SYNTHETIC RUBBER	0	0	0.00	0.00
130	2823	CELLULOSIC MANMADE	0	42	0.00	0.00
131	2831	BIOLOGICAL PRODUCTS	773	0	0.48	0.00

ROW	SIC	NAME	A67	A82	AS67	AS82
132	2833	MEDICINALS: BOTANICALS	0	0	0.00	0.00
133	2834	PHARMACEUTICAL	285,901	710,595	6.08	3.74
134	2841	SOAP: OTHER DETERGENTS	207,225	373,048	7.99	4.06
135	2843	SURFACE ACTIVE	2,827	0	0.96	0.00
136	2844	TOILET PREPARATIONS	389,351	1,120,578	15.48	11.00
137	2861	GUM: WOOD CHEMICALS	376	0	0.17	0.00
138	2865	CYCLIC CRUDES AND	0	0	0.00	0.00
139	2893	PRINTING INK	0	0	0.00	0.00
140	2895	CARBON BLACK	0	0	0.00	0.00
141	2911	PETROLEUM REFINERY	95,550	91,587	0.47	0.04
142	2951	PAVING MIXTURES: BLOCKS	0	0	0.00	0.00
143	2952	ASPHALT FELTS: COATINGS	251	329	0.04	0.01
144	3011	TIRES: INNER TUBES	45,522	72,225	1.21	0.77
145	3031	RECLAIMED RUBBER	0	0	0.00	0.00
146	3111	LEATHER TANNING: FNSHNG	0	137	0.00	0.00
147	3131	BOOT: SHOE CUT STOCK	0	41	0.00	0.01
148	3142	HOUSE SLIPPERS	0	330	0.00	0.12
149	3151	DRESS: WORK GLOVES	134	0	0.15	0.00
150	3161	SUITCASES, BRIEFCASES	3,015	8,458	0.90	1.07
151	3171	WOMENS: CHILDRENS	847	1,945	0.25	0.31
152	3172	PERSONAL LEATHER GOODS	1,943	2,228	1.04	0.54
153	3211	FLAT GLASS	1,577	59	0.25	0.00
154	3221	GLASS CONTAINERS	298	1,339	0.02	0.02
155	3231	PRODUCTS OF PURCHASED	318	1,639	0.04	0.05
156	3241	CEMENT, HYDRAULIC	9	339	0.00	0.00
157	3251	BRICK: CONSTRUCTIONAL	3	76	0.00	0.01
158	3253	CLAY FLOOR: WOOD TILE	0	668	0.00	0.16
159	3255	CLAY REFRACTORIES	0	0	0.00	0.00
160	3261	VITREOUS: SEMIVITREOUS	0	10	0.00	0.00
161	3262	VITREOUS: PORCELAIN	1,650	10,649	2.46	4.41
162	3263	EARTHENWARE SEMIVITREOUS	610	1,501	1.29	1.72
163	3264	CERAMIC ELECTRICAL	0	0	0.00	0.00
164	3271	CONCRETE BLOCK: BRICK	0	0	0.00	0.00
165	3272	CONCRETE PRODUCTS	69	52	0.00	0.00
166	3273	READY MIXED CONCRETE	130	0	0.00	0.00
167	3274	LIME	0	2	0.00	0.00
168	3275	GYPSUM PRODUCTS	0	0	0.00	0.00
169	3281	CUT STONE: STONE	180	8	0.07	0.00
170	3291	ABRASIVE PRODUCTS	4,652	4,657	0.64	0.16
171	3295	MINERALS: EARTHS	0	5,079	0.00	0.40
172	3296	MINERAL WOOL	0	9,165	0.00	0.40
173	3297	NONCLAY REFRACTORIES	0	74	0.00	0.01
174	3312	BLAST FURNACES AND STEEL	36	104	0.00	0.00
175	3313	ELECROMETALLURGICAL	0	0	0.00	0.00
176	3315	STEEL WIRE AND RELATED	692	3	0.08	0.00
177	3316	COLD FINISHING OF STEEL	0	0	0.00	0.00

ROW	SIC	NAME	A67	A82	AS67	AS82
178	3317	STEEL PIPES AND TUBES	0	0	0.00	0.00
179	3321	GRAY IRON FOUNDRIES	0	0	0.00	0.00
180	3322	MALLEABLE IRON FOUNDRIES	0	0	0.00	0.00
181	3331	PRIMARY COPPER	0	0	0.00	0.00
182	3332	PRIMARY LEAD	0	0	0.00	0.00
183	3333	PRIMARY ZINC	0	0	0.00	0.00
184	3334	PRIMARY ALUMINUM	0	18	0.00	0.00
185	3341	SECONDARY NONFERROUS	4	2	0.00	0.00
186	3351	COPPER ROLLING: DRAWING	0	0	0.00	0.00
187	3356	NONFERROUS ROLLING	0	0	0.00	0.00
188	3357	NONFERROUS WIREDRAWING	0	0	0.00	0.00
189	3361	ALUMINUM CASTINGS	764	136	0.08	0.00
190	3362	COPPER: COPPER BASE	0	0	0.00	0.00
191	3411	METAL CANS	0	1,835	0.00	0.01
192	3412	METAL BARRELS, DRUMS	0	0	0.00	0.00
193	3421	CUTLERY	23,139	33,949	6.12	3.61
194	3423	HAND: EDGE TOOLS	1,187	6,478	0.14	0.22
195	3425	HANDSAWS, SAW BLADES	84	2	0.05	0.00
196	3431	METAL PLUMBING FIXTURES	115	125	0.04	0.02
197	3432	PLUMBING FIXTURE	465	7,527	0.11	0.57
198	3441	FABRICATED STRUCTURAL	3	0	0.00	0.00
199	3442	METAL DOOR, SASH: TRIM	104	8,408	0.00	0.17
200	3443	FABRICATED PLATEWORK	0	52	0.00	0.00
201	3444	SHEET METALWORK	707	1,094	0.03	0.01
202	3446	ARCHITECTURAL	0	77	0.00	0.00
203	3451	SCREW MACHINE PRODUCTS	0	15	0.00	0.00
204	3452	BOLTS, NUTS, RIVETS	57	27	0.00	0.00
205	3462	IRON: STEEL FORGING	0	0	0.00	0.00
206	3463	NONFERROUS FORGING	0	0	0.00	0.00
207	3471	PLATING AND POLISHING	0	0	0.00	0.00
208	3479	METAL COATING AND ALLIED	0	6,547	0.00	0.27
209	3493	STEEL SPRINGS, EXCEPT	0	0	0.00	0.00
210	3494	VALVES: PIPE FITTINGS	0	139	0.00	0.00
211	3497	METAL FOIL: LEAF	0	156	0.00	0.00
212	3498	FABRICATED PIPE	0	0	0.00	0.00
213	3511	TURBINE: TURBINE	92	0	0.00	0.00
214	3532	MINING MACHINERY	0	9	0.00	0.00
215	3534	ELEVATORS: MOVING	291	103	0.09	0.00
216	3535	CONVEYORS: CONVEYING	20	120	0.00	0.00
217	3537	INDUSTRIAL	538	1,001	0.06	0.05
218	3541	MACHINE TOOLS, METAL	3	89	0.00	0.00
219	3542	MACHINE TOOLS	0	87	0.00	0.00
220	3544	SPECIAL DIES, TOOLS	0	0	0.00	0.00
221	3545	MACHINE TOOL ACCESSORIES	54	51	0.00	0.00
222	3551	FOOD PRODUCTS MACHINERY	0	16	0.00	0.00
223	3552	TEXTILE MACHINERY	0	0	0.00	0.00

ROW	SIC	NAME	A67	A82	AS67	AS82
224	3554	PAPER INDUSTRIES	0	0	0.00	0.00
225	3555	PRINTING TRADES	46	0	0.00	0.00
226	3562	BALL: ROLLER BEARINGS	699	195	0.05	0.00
227	3564	BLOWERS: FANS	7	3,864	0.00	0.17
228	3565	INDUSTRIAL PATTERNS	0	0	0.00	0.00
229	3567	INDUSTRIAL FURNACES	41	0	0.00	0.00
230	3573	ELECTRIC COMPUTING EQUIP	3,074	184,814	0.08	0.50
231	3574	CALCULATING: ACCOUNTING	1,827	5,939	0.25	0.39
232	3576	SCALES: BALANCES	92	51	0.06	0.01
233	3581	AUTOMATIC MERCHANDISING	0	0	0.00	0.00
234	3586	MEASURING: DISPENSING	0	0	0.00	0.00
235	3612	TRANSFORMERS	0	0	0.00	0.00
236	3613	SWITCHGEAR	0	0	0.00	0.00
237	3621	MOTORS: GENERATORS	78	864	0.00	0.01
238	3622	GENERAL INDUSTRY POWER	0	51	0.00	0.00
239	3623	WELDING APPARATUS	0	0	0.00	0.00
240	3624	CARBON: GRAPHITE	0	0	0.00	0.00
241	3631	HOUSEHOLD COOKING	2,584	19,727	0.46	0.81
242	3632	HOUSEHOLD REFRIGERATORS	8,925	4,023	0.50	0.16
243	3633	HOUSEHOLD LAUNDRY	7,382	7,870	0.75	0.37
244	3634	ELECTRIC HOUSEWARES	30,518	53,001	2.74	1.67
245	3635	HOUSEHOLD VACUUM	2,562	14,515	0.87	1.87
246	3636	SEWING MACHINES	3,113	2,897	2.53	0.96
247	3641	ELECTRIC LAMPS	5,697	8,584	0.72	0.41
248	3643	CURRENT-CARRYING WIRING	14	162	0.00	0.00
249	3644	NONCURRENT-CARRYING	0	0	0.00	0.00
250	3651	RADIO: TV RECEIVING	48,474	129,160	1.26	2.13
251	3652	PHONO RECORDS, RECORD	22,517	235,689	8.15	13.33
252	3661	TELEPHONE: TELEGRAPH	177	9,644	0.01	0.07
253	3662	RADIO: TV COMMUNICATION	227	16,604	0.00	0.05
254	3674	SEMICONDUCTORS: RELATED	104	0	0.00	0.00
255	3691	STORAGE BATTERIES	2,408	5,210	0.41	0.21
256	3692	PRIMARY BATTERIES, DRY	2,695	46,707	0.87	4.24
257	3693	X-RAY APPARATUS/TUBES	0	217	0.00	0.00
258	3694	ENGINE ELECTRICAL	7,295	9,280	0.53	0.26
259	3711	MOTOR VEHICLES: CAR	328,917	1,018,907	1.20	1.44
260	3714	MOTOR VEHICLE PARTS	5,222	12,030	0.04	0.03
261	3715	TRUCK TRAILERS	76	0	0.01	0.00
262	3721	AIRCRAFT	3,492	6,855	0.03	0.02
263	3731	SHIP BUILDING	190	36	0.00	0.00
264	3732	BOAT BUILDING	1,631	1,891	0.28	0.08
265	3751	MOTORCYCLES, BICYCLES	3,678	52,546	1.23	3.91
266	3811	ENGINEERING: SCIENTIFIC	118	21	0.01	0.00
267	3822	AUTOMATIC TEMPERATURE	234	2	0.03	0.00
268	3825	INSTRUMENTS TO MEASURE	0	308	0.00	0.00
269	3841	SURGICAL: MEDICAL	0	718	0.00	0.01



ROW	SIC	NAME	A67	A82	AS67	AS82
270	3842	SURGICAL APPLIANCES	8,604	28,750	1.02	0.50
271	3843	DENTAL EQUIPMENT	0	0	0.00	0.00
272	3851	OPHTHALMIC GOODS	2,021	21,899	0.47	1.70
273	3861	PHOTOGRAPHIC EQUIP AND	42,933	229,765	1.17	1.34
274	3914	SILVERWARE AND PLATEWARE	4,133	5,525	1.21	0.94
275	3931	MUSICAL INSTRUMENTS	2,995	5,521	0.69	0.60
276	3942	DOLLS: STUFFED TOYS	12,683	33,238	7.82	8.39
277	3952	LEAD PENCILS: ART GOODS	321	1,161	0.20	0.26
278	3955	CARBON PAPER AND INKED	0	28	0.00	0.00
279	3962	FEATHERS, PLUMES	0	585	0.00	0.22
280	3963	BUTTONS: PARTS	0	8	0.00	0.00
281	3964	NEEDLES, PINS	1,494	551	0.38	0.07
282	3991	BROOMS: BRUSHES	1,133	7,642	0.30	0.93
283	3993	SIGNS: ADVERTISING	0	783	0.00	0.02
284	3996	HARD SURFACE FLOOR	10,651	18,744	4.81	3.10

**Electronic versions of these data for both 1967 and 1982  
are available in standard spreadsheet formats by request from:**

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