

TABLE 4.—ADVERTISING OUTLAY AND AVERAGE EARNINGS OF 29 DRUG MANUFACTURERS

Advertising expenditures in 1966	Number of companies	Advertising as percent of sales	Average earnings on stockholder investment ¹ (percent)	Standard deviation (percent)
Over \$50,000,000 ¹	5	24.1	29.2	5.8
\$10,000,000 to \$50,000,000 ²	9	11.9	19.7	6.6
Under \$10,000,000	15	(3)	17.3	8.3
Total	29		20.1	8.6

¹ Simple average of after-tax earnings for the period 1961-65.

² Drug companies included in the Conrad-Plotkin study with advertising expenditures of \$10,000,000 or more in 1966, as reported in *Advertising Age*, Aug. 28, 1967, p. 36.

³ Not available.

Relationship between product differentiation and profits

To test the hypothesis that product differentiation caused profit variance is largely responsible for the statistical association uncovered by Conrad and Plotkin, we have analyzed separately their consumer goods and producer goods manufacturing industries. Product differentiation, of course, shows up primarily in consumer goods.

Figure 4 shows all the industries used by Conrad and Plotkin. They find a modest degree of correlation between intra-industry profit variance and profits using one measure of profit rates.³³

Figure 5A shows the plotted observations of the consumer goods industries used in the Conrad-Plotkin analysis, and Figure 5B shows the plotted observations of the producer goods industries.³⁴ Among consumer goods industries there is a quite strong positive relationship, whereas among producer goods industries the relationship is very weak, and is not statistically significant.

³³ Conrad and Plotkin test their theoretical analysis against a number of measures of rates of return and risk. They report the results of fitting eight distinct models in Appendix Tables D-1 and D-2 of their report and refer to others in the text. Most of the discussion and the conclusions of the report, however, are based primarily on the two measures which resulted in the best fitting models.

The first and most important of these is a model in which rate of return is defined as net profit plus fixed charges over total capitalization. The risk coefficient is the average yearly intra-industry variability of company profit ratios for the period 1950-1965. The mechanics of computation were to calculate a variance of company profit ratios about the industry average profit ratio in each year of the 16-year period and then compute a simple average.

Conrad and Plotkin used the coefficient of determination (R^2) to evaluate the goodness of fit of their simple correlation-regression models. The R^2 for the first model was .46. This means that 46 percent of the difference in industry profit levels was associated with the intra-industry variance in profits. Corresponding R^2 values for two other models using book value rates of return were .31 (net income as a percent of total assets) and .18 (net income as a percent of common equity).

In addition to the models using book value measures of rates of return, Conrad and Plotkin also apply their analysis to returns to stockholders calculated as a percent of the market value of outstanding stock. This ratio is defined as the total of dividends, fixed charges, and the change in market value of shares of common stock during the year divided by the market value of common shares outstanding at the beginning of the year. The risk coefficient computed on the basis of this earnings ratio is suggested as a measure of the market risk to present and prospective purchasers of outstanding shares of stock. There is apparently no claim that it is an indicator of the company's ability to attract new investment financing or that it indicates the way in which real resources in the economy should be allocated efficiently between industries. We concur with this. The relevant comparison in evaluating an industry's ability to attract new capital should be expected earnings relative to cost of capital. The market value of outstanding stock may bear little relationship to a company's earning on invested capital because the market value of outstanding stock has capitalized into it expected future income resulting from monopoly profits. Because of this, a firm enjoying the benefits of monopoly and earning profits well in excess of the cost of capital may exhibit only a normal rate of return per dollar of equity measured at market prices.

³⁴ We have excluded the following industries from our analyses because none, strictly speaking, is a manufactured product: Radio-TV broadcasters, book publishing, publishing, trucking, eating places, department stores, apparel retailers, air transport, shipping, variety retailers, food retailers, and financial institutions. Leading firms in all of these industries, with the possible exception of shipping and trucking, enjoy varying degrees of product differentiation. Therefore these industries do not meet the homogeneity assumption of the Conrad-Plotkin model. They therefore most appropriately should be grouped with the consumer goods industries shown in Figure 5A. When the above 12 industries are included with the 15 consumer goods industries plotted in Figure 5A, the resulting R^2 is 0.63.