

where  $r_e$  is the <sup>average</sup> rate of return of the tax-exempt firms  
 $r_n$  is the corresponding rate for non-tax-exempt firms  
 $s_{r_e}$  and  $s_{s_r}$  the corresponding standard deviations of  
the average rates.

By taking these differences of the average rates of return and of their corresponding standard deviations, we are able to use at least two classifying items in segregating the industry groups under consideration. The classifications I have used are as follows:

- ✓ Group I - Rates of return in tax-exempt industries higher by at least 5 per cent points than the non-tax-exempt group;
- Group II - Rates of return not very different among the two groups (i.e., the difference in per cent points is only by less than 5 per cent points); and
- Group III - Rates of return greater for the non-tax-exempt.

Tables 1 and 2 show that the rates of return to sales and to equity capital do not necessarily contain the same information about the firms in particular industry groups. Generally, the rates of return to equity are higher than the rates of return to sales, a fact already implied by the sales-equity ratio in

Table 1

Per Cent Values of  $r_e$ ,  $s_{r_e}$  for Tax-Exempt Firms  
and  $\Delta r$  and  $\Delta s$ : Sales

	$r_e$	$s_{r_e}$	$\Delta r$	$\Delta s$
I. Tobacco Products 22	18.65	9.70	16.57	8.70
Footwear 24	8.81	5.48	6.00	4.94
Paper and Paper Products 27	12.47	9.11	5.93	1.49
Rubber Products 30	18.58	3.87	15.92	3.04
II. Food 20	11.77	8.12	0	4.51
Textiles 23	10.07	7.81	.98	4.35
Wood and Cork 25	1.21	6.00	(.12)	2.84
Printed and Published 28	4.68	1.73	(.65)	(.27)
Miscellaneous 39	6.08	7.81	2.66	3.45
III. Chemicals 31	.66	.60	(9.66)	(3.64)
Non-metallic Mineral 33	3.97	2.83	(10.52)	(.91)
Machinery 36	5.59	2.83	( 3.18)	1.91
Transportation Equipment 38	3.92	1.73	( 4.69)	.32

Table 2

Per Cent Values of  $r_e$ ,  $s_{r_e}$  for Tax-Exempt Firms  
and  $\Delta r$  and  $\Delta s$ : Equity

	$r_e$	$s_{r_e}$	$\Delta r$	$\Delta s$
I. Food	48.05	29.58	31.10	22.30
Tobacco Products	29.77	15.23	16.37	6.40
Footwear	17.06	5.00	9.54	3.59
Rubber Products	40.23	8.06	30.02	3.16
Chemicals	27.90	13.45	12.39	(1.81)
Transportation	28.88	11.49	9.20	6.91
II. Wood and Cork Products	8.58	18.14	2.03	4.21
Paper and Paper Products	19.27	14.73	2.38	(2.65)
Printed and Published	14.13	5.38	1.22	.28
Miscellaneous	11.26	16.37	1.87	4.29
III. Textiles	17.94	14.52	(9.41)	(.07)
*Non-metallic Mineral	8.30	5.47	(15.03)	(2.47)
Machinery	12.83	7.48	(5.26)	4.84



both industry groups being more often than not higher than unity.

(If we use this ratio as an approximation of the output-capital ratio, then a number of industries can in fact be classified as having relatively high ratios: namely, food, rubber, even transport equipment of the "non-heavy" type chemicals. Those with relatively lower sales-equity ratios are paper, printed and published materials and wood and cork.

Sales  
Equity

✓ Under Group I are footwear, tobacco, rubber, paper and paper products. The list is increased if the rates of returns considered are on equity capital. Food, chemicals, and transport equipment show relatively high difference in the rates of returns to equity capital.

Group II contains just as many industry groups. Taking into account the rates of return on equity alone, this is true for four industrial groups -- wood and cork, paper, printed and published, and the miscellaneous group. Of the last group, those in which industries in the non-tax-exempt classes and higher than rates of return than the tax-exempt, at least three industry groups can be mentioned (in terms of rates of return to equity capital). These are textiles, non-metallic mineral, and machinery.

✓ There are important reasons why the difference between tax- and non-tax-exempt rates of return should be either small or in favor of non-tax-exempt classes. Normally, the expectation

is that once an industrial activity is given tax-exemption and other fringe benefits (such as favorable credit treatment and foreign exchange allocations), its profit rates would be high enough to create inducements to establish early -- probably much higher than a "required minimum." Since assurances of this type reduce the possibility of riskiness, or at least would normally provide for a lower variance around the average rate of return, the inducement to establish the industries would be strengthened.<sup>13</sup> Looking at purely ex post data, such a priori conclusion does not seem to be warranted. At least the variations about the average rates of return are wider in the tax-exempt firms than in the non-tax-exempt. <sup>\*</sup> Could they have been wider if there were such inducements? I am not sure that these data, however, warrant

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<sup>13</sup>It may be argued that the grant of the tax-exemptions were really assurances against risks. We may quote Raymond Vernon at this point:

"The applicability of comparative advantage doctrine relates not only to issues of information and ignorance but also to problems of risk -- risk in the sense of the anticipated variance about a mean expectation. As economists, we tend to assume that given price levels will generate given responses of producers and exporters. If risk enters the picture in some way, we try whenever we can to convert the risk factor into an element of cost or profit.

"The inadequacy of this approach stems from the fact that where a given level of risk is perceived by a group of entrepreneurs, they may be totally unwilling to act, irrespective of the average profit to be derived. The reason for their unwillingness may be quite rational; a run of losses, for instance, could put them out of the game. Accordingly, the variance about a mean expectation may condition behavior as much as the mean itself.

the conclusion that the Filipino entrepreneur is more risk-taking than he is often given credit. In another paper, I have stressed that he is protection-centered,<sup>14</sup> in the sense that he has a tendency to seek government protection much more than he would tend to engage in more competitive activities.<sup>15</sup> The kind of entrepreneurial spirit nurtured during the period of controls tended to be of this kind.

✓ In the second place, the direction of the rates of return per industry group if plotted against time shows that such variation in profit rates may be strongly related to the balance of payments condition of the country. Except for the year 1957 when the rates of return were low,<sup>16</sup> rates of return were generally

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"Once more, it is worth observing that the impression of this problem need not be crippling in every setting. In a comparatively stable situation, where most contingencies can be foreseen or can be hedged, perceived risk may be of very little importance. But this hardly describes the situation facing entrepreneurs in less developed areas, especially as they confront problems of international trade. The reduction of risk, therefore, may prove more important for such a group than the maximizing of yield. A systematic formulation of concepts in this area as they affect international trade would be a valuable addition to comparative cost theory." Raymond Vernon, "Discussion-Comparative Costs and Economic Development," American Economic Review, vol. 54 (May, 1964), 435-6.

<sup>14</sup>See "Industrial Policy and the Development of Manufacturing in the Philippines," Institute of Economic Development and Research, Discussion Paper 65-1, January 5, 1965.

<sup>15</sup>Examples -- cement, textiles and petroleum.

<sup>16</sup>Such a situation may have been due to the fact that 1957 was the year when foreign exchange deficits caused the tightening of controls on foreign exchange allocations and, therefore, led to the first profit squeeze on most industries to which initial response led to low profits.



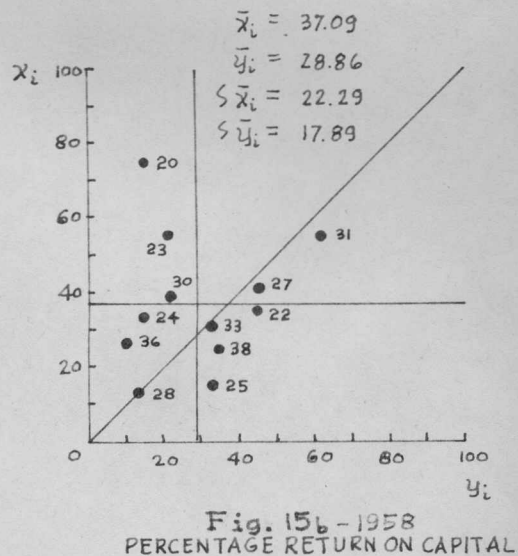
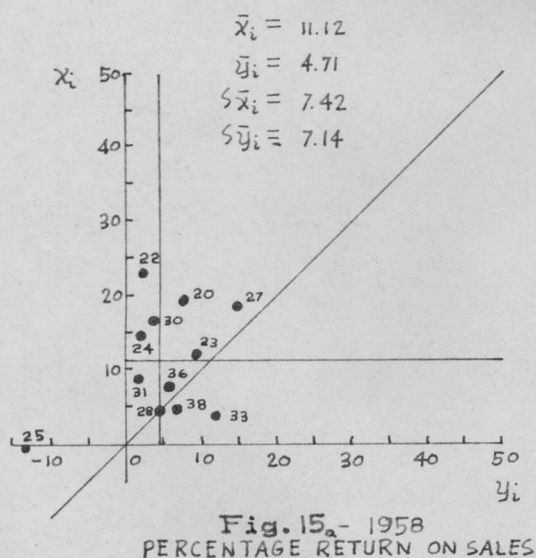
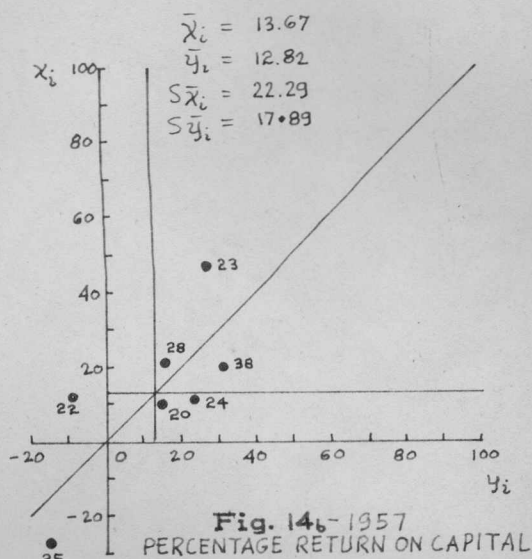
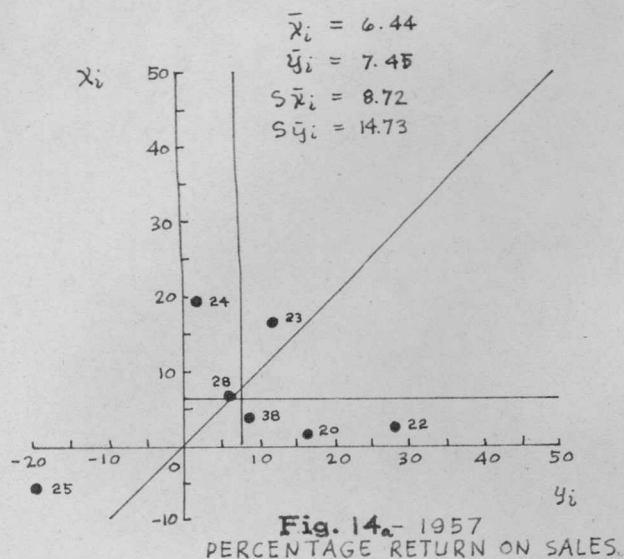
very high and went down from year to year. The same period corresponded to the balance of payments crises in the Philippines, which can be described mostly by a worsening exchange rate and by more stringent controls on foreign exchange allocations. [Considering the high import-dependence of most of the industries established, such foreign exchange conditions affected profit rates adversely. It may be that entrepreneurs really miscalculated the extent to which the government was capable of extending support to them. Although tax exemption could have been crucial aspect of industrial development in the early part of the 1950's, what seemed important in affecting industrial activity was the tool of foreign exchange controls.]

The above discussion gives a rough answer to the three questions posed at the beginning of this section. We shall give a more detailed analysis of these questions in the section that follows the next.

#### Manufacturing Aggregated Over Time and by Industry Groups

We now aggregate all the industry groups mentioned into only two broad sub-groups in the manufacturing sectors -- the tax-exempt and the non-tax-exempt. Detailed scatters corresponding to the ones already drawn for each industry group in any particular year are given. These are all shown by Figures 14 to 19, with the corresponding subscripts a and b as earlier described.

$x_i$  = mean rate of return on sales or capital of tax exempt industries  
 $y_i$  = mean rate of return on sales or capital of non-tax-exempt industries  
 $i$  - industry groups 20, 21, 22, 23..... 39



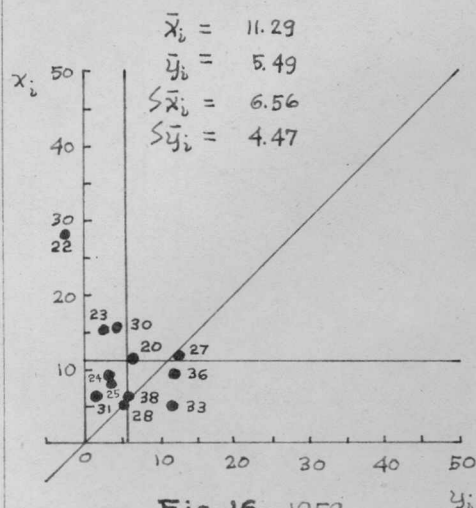
SCATTER DIAGRAMS OF PERCENTAGE RETURN  
 ON SALES AND CAPITAL OF TAX-EXEMPT INDUSTRIES  
 AND NON-TAX-EXEMPT INDUSTRIES CLASSIFIED  
 BY YEAR OF PRODUCTION



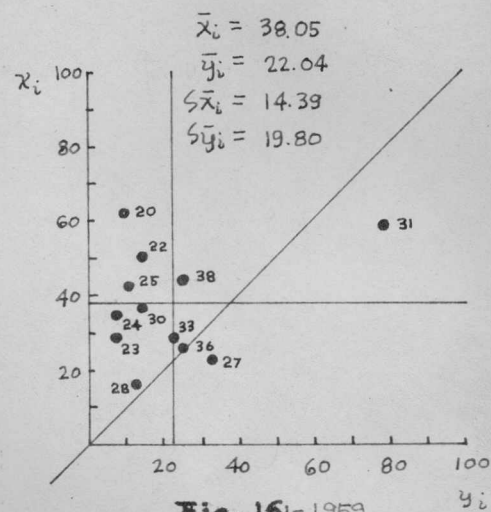
$x_i$  = mean rate of return on sales or capital of tax-exempt industries

$y_i$  = mean rate of return on sales or capital of non-tax-exempt industries

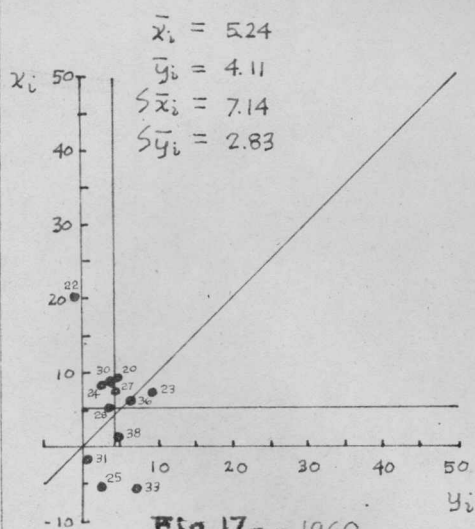
$i$  - industry groups 20, 21, 22, 23 ..... 39



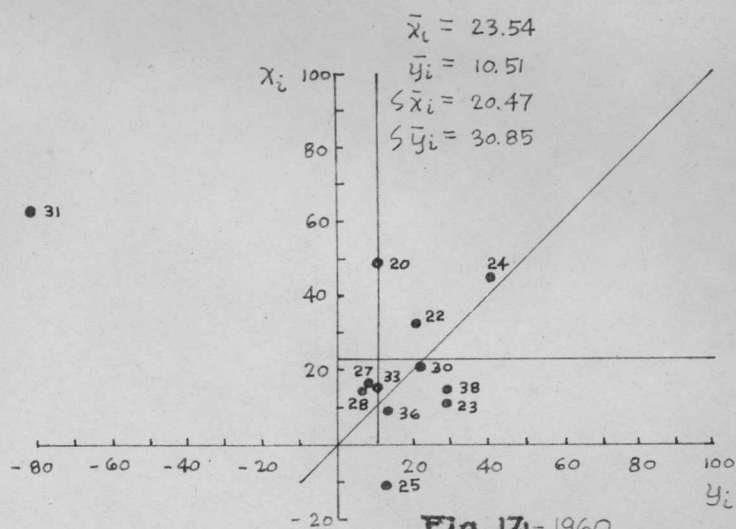
**Fig. 16a - 1959**  
PERCENTAGE RETURN ON SALES



**Fig. 16b - 1959**  
PERCENTAGE RETURN ON CAPITAL



**Fig. 17a - 1960**  
PERCENTAGE RETURN ON SALES



**Fig. 17b - 1960**  
PERCENTAGE RETURN ON CAPITAL

SCATTER DIAGRAMS OF PERCENTAGE RETURN  
ON SALES AND CAPITAL OF TAX-EXEMPT INDUSTRIES  
AND NON-TAX-EXEMPT INDUSTRIES CLASSIFIED  
BY YEAR OF PRODUCTION

$\bar{r}_e^*$  = mean rate of return on sales or capital of tax-exempt industries  
 $\bar{r}_n^*$  = mean rate of return on sales or capital of non-tax-exempt industries  
 (All averages are derived from the mean rates of return of the 2-digit industry groups 29, 21, 22 ..... 39.)

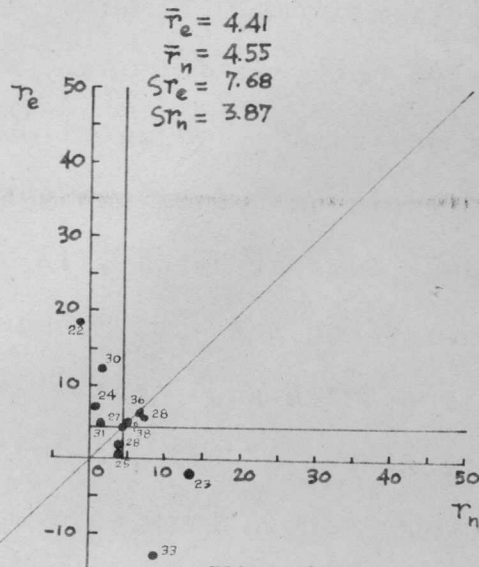


Fig. 18<sub>a</sub> - 1961  
 PERCENTAGE RETURN ON SALES

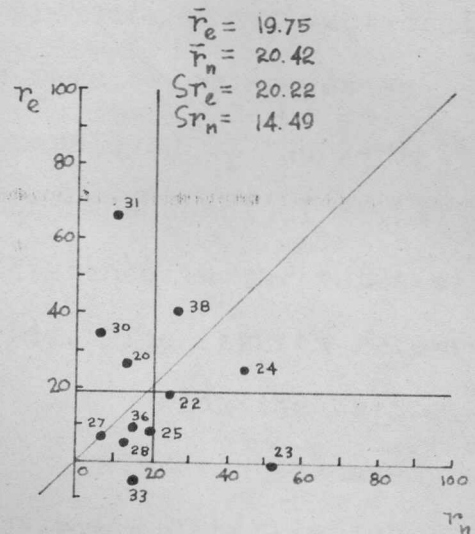


Fig. 18<sub>b</sub> - 1961  
 PERCENTAGE RETURN ON CAPITAL

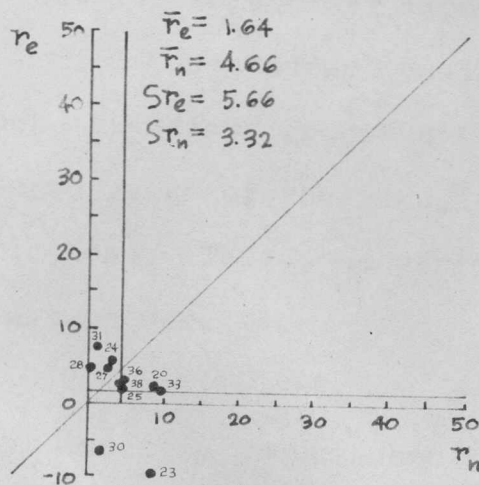


Fig. 19<sub>a</sub> - 1962  
 PERCENTAGE RETURN ON SALES

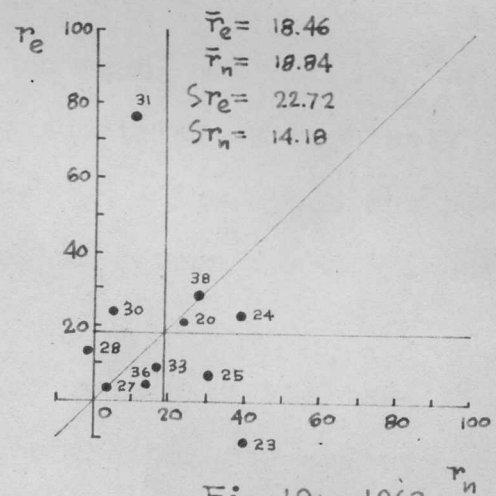


Fig. 19<sub>b</sub> - 1962  
 PERCENTAGE RETURN ON CAPITAL

SCATTER DIAGRAMS OF PERCENTAGE RETURN  
 ON SALES AND CAPITAL OF TAX-EXEMPT INDUSTRIES  
 AND NON-TAX-EXEMPT INDUSTRIES CLASSIFIED  
 BY YEAR OF PRODUCTION

The computations of average rates are from cross-sectional data, each observation being the average rate of return of an industry group. Using the same technique employed in the 2-digit disaggregations, the results tend to support the conclusion that over-all, there is some, but not much, difference in the rates of return of tax- and non-tax-exempt industries. The figures referred to show some such difference. It appears that during the latter part of the 1950's and in 1960, the rates of return to tax-exempt industries were higher than for the non-tax-exempt, but in 1961 and 1962 the non-tax-exempt generally had higher rates of return. Note however some other important results.

1. The standard deviations for each mean, whether for tax- or non-tax-exempt groups are rather high, sometimes as high as the measured value of the mean, sometimes more, on a few occasions a little less. Thus, the variation in rates of return for all industry groups were wide.

2. Until 1960, the average rates of return of the tax-exempt industry groups were higher than for the non-tax-exempt groups. In 1961 and 1962, this was reversed. This supports the evidence about the ill effects on industrial development of the high import dependence of many tax-exempt enterprises.

3. But the tax-exempt firms had higher standard deviation than non-tax-exempt firms, except for two anachronistic (hard to explain, except by alluding to an extreme industry group example) years. This further supports the wider variation in profitability



of the tax-exempt firms. The only additional explanation that may be added is that those firms which were able to maintain their allocations of foreign exchange were able to earn high profits.

4. The observations should be further tempered by the fact that the data used in these aggregations to total manufacturing were the average rates of return of the 2-digit ISIC aggregates. We have noted already that the standard deviations of the firms are generally wider for tax-exempt than for the non-tax-exempt where such measures were available because of the relatively large number of firms in comparable industry groups. The wide variations observed for the whole tax-exempt industry groups is further amplified by the variations observed per 2-digit industry aggregates.

#### IV. Findings: Further Statistical Analysis

Analysis of variance enables us to segregate the variance accounted for by different factors. Through the computation of an F-statistic, it is possible to test in a meaningful statistical sense whether the variability accounted for by one or more factors is significant or not. We therefore test at a given level of significance the differences in the rates of return in Philippine manufacturing accounted for by a number of factors. Three levels of analyses are made:

1. For all the years when data are available, an analysis of the rates of return of a given class of firms among the industry groups contained in it.
2. An analysis of the differences of the rates of return between tax- and non-tax-exempt firms (classes of firms) in the same industry groups for any given year and later, for all the years included.
3. An analysis of the differences in the standard deviations among different industry groups and the classes of firms based on average rates of return computed over the years.

Of course, the rates of return under consideration are on equity and on sales. The summary of the statistical tests are contained in the appendix.

1. Rates of Return Within a Given Class of Firms ✓

Table 3 shows the summary of results of the F-values computed when for a given class of firms, e.g., the tax-exempt, we test the variability of the rates of return among different industry groups. The null hypothesis of the tests is that the rates of return are equal among the different industry groups. The rates of return data for the industries used in the tests are from 1957 to 1962.<sup>17</sup>

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<sup>17</sup>The method employed is one-way analysis of variance with replication of yearly observations.

Table 3

Difference of Rates of Return Within a Given Class  
of Firms: Summary of F-Values

Classes of Firms	:	:	:
	:	Sales	:
	:	:	Equity
	:	F	:
	:	(n,d)	:
	:	:	F
	:	:	(n,d)
Tax-Exempt Firms		4.0198 (12, 65)	4.4593 (12, 65)
Non-Tax-Exempt Firms		21.372 (11, 60)	8.856 (11, 60)

Notes: All F-values significant at 1 per cent level.

The numbers in the parentheses are the degrees of freedom of the F-statistic where n = numerator, d = denominator.

All of the results reject the null hypothesis of equality of rates of return among industry groups for both classes of firms and for any measure of rate of return. Thus, it can be concluded that the rates of return vary among the different industry groups within a given class of firms.

## 2. Rates of Return Between Classes of Firms in the Same Industry Groups.

Rates of Return for any given year. Although it has been established that for a given class of firms (either tax-



or non-tax-exempt), the rates of return obtaining for industry groups are unequal in a statistical sense, it is most interesting to ask the question of whether the rates of return for both classes of firms are any different for any given year. To do this, the differences between the rates of return in every industry group in which a pair of rates of return for both tax- and non-tax-exempt firms exist have to be tested. The presence of both classes of firms appearing for a given industry group has to be a condition prior to having the test performed. The data used are similar to those appearing in the scatters contained in Figures 1 to 13. In the present tests, however, only the yearly rates of return data are used, and so the tests are performed for each year.

Specifically (for any given year), the analysis of variance tests<sup>18</sup> applied are on the two following hypotheses:

- (1) the rates of return among industry groups are the same; and
- (2) the rates of return for tax- and non-tax-exempt (classes of) firms are the same.

Should the F-values derived exceed the tabular F's, at a given level of significance, then the null hypothesis is to be rejected.

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<sup>18</sup>The analysis of variance tests employed were of the two-factor non-replicative type. The data for each class of firms could be replicated, as in the earlier tests reported, by using yearly rates of return data for each industry group, but the tests used were found adequate for the meantime.

This has the consequence of the conclusion that the rates of return were different in a statistical sense. Likewise, as before, the rates of return data used are on sales and on equity.

Table 4 summarizes the F-values computed for both sets of rates of return data. All the F-values are less than the tabular values at the 10 per cent level of significance, whether the source of variability used is among differences in industry groups or in classes of firms. There were three cases in which the computed F exceeded the tabular F-values. These occurred for the F-values accounting for any variation due to differences in the classes of firms. However, two of the cases are significant only at the 10 per cent level. The third case is significant at the 2.5 per cent level, but since it occurs in isolation one can almost think of it as an accidental case.

The conclusion therefore is that for any given year, the rates of return in industry groups containing two classes of firms are equal or not significantly different. Secondly, the rates of return for tax- and non-tax-exempt firms are not significantly different over the industry groups in which comparison were possible. Thus, although visually one would expect from the scatter diagrams already demonstrated that the rates of return for tax-exempt firms would tend to be higher than for the non-tax-exempt firms, yet a more rigorous statistical test confirms that such differences, if there were any, were not significant.

Table 4

Summary of Computed Values of F for Two-Factor  
Analysis of Variance Rates of Return on  
Equity and Sales

Year	Source of Variation	Sales F (n,d)	Equity F (n,d)
1957	Among Industry Groups	1.8502 (6, 6)	0.0577 (6, 6)
	Among Classes of Firms	0.0785 (1, 6)	0.0016 (1, 6)
1958	Among Industry Groups	1.3210 (12, 12)	1.3309 (12, 12)
	Among Classes of Firms	3.3922* ( 1, 12)	1.4138 ( 1, 12)
1959	Among Industry Groups	0.6634 (12, 12)	0.6486 (12, 12)
	Among Classes of Firms	3.9329* ( 1, 12)	7.0929** ( 1, 12)
1960	Among Industry Groups	0.9274 (12, 12)	0.8324 (12, 12)
	Among Classes of Firms	0.6860 ( 1, 12)	0.5413 ( 1, 12)
1961	Among Industry Groups	0.5086 (12, 12)	0.7947 (12, 12)
	Among Classes of Firms	0.0662 ( 1, 12)	0.0155 ( 1, 12)
1962	Among Industry Groups	0.8161 (11, 11)	1.1224 (11, 11)
	Among Classes of Firms	0.2399 ( 1, 11)	0.0161 ( 1, 11)

\*Significant at 10% level.

\*\*Significant at 2.5% level.

Note: The numbers in the parentheses are the degrees of freedom of F-statistic where n = numerator and d = denominator.



Average rates of return over the years. The rates of return between tax- and non-tax-exempt firms proved to be not significantly different. The summaries of the F-values derived are shown in Table 5.

Table 5

Analysis of Variance on Average Rates of Return, 1957-62

Source of Variation	:	:
	:	:
	Sales	Equity
	:	:
	F	F
	(n,d)	(n,d)
Among Industry Groups	0.5328 (12, 12)	1.0283 (12, 12)
Among Class of Firms	0.4191 ( 1, 12)	3.0668 ( 1, 12)

Note: The numbers in the parentheses are the degrees of freedom of the F-statistic where n = numerator  
d = denominator.

All the F-values were found to be not significant even at the 10 per cent level. This finding provides additional support for the results shown in the year-by-year tests that, although generally some of the rates of return for tax-exempt firms were higher than for the other class of firms, such differences were not statistically significant.]