

This PDF is a selection from an out-of-print volume from the National Bureau of Economic Research

Volume Title: Taxable and Business Income

Volume Author/Editor: Dan Throop Smith and J. Keith Butters

Volume Publisher: NBER

Volume ISBN: 0-870-14118-X

Volume URL: <http://www.nber.org/books/smit49-1>

Publication Date: 1949

Chapter Title: Book Profit and Statutory Net Income

Chapter Author: Dan Throop Smith, J. Keith Butters

Chapter URL: <http://www.nber.org/chapters/c3250>

Chapter pages in book: (p. 222 - 258)

## CHAPTER 12

### Book Profit and Statutory Net Income

THE COMPARISON OF BOOK PROFIT AND STATUTORY NET INCOME described in this chapter is based primarily upon Sample III; subsidiary use is made of Sample II. The individual gross income and deduction items that make for divergences between book profit and statutory net income are discussed in the next chapter.

#### A FINDINGS OF SAMPLE III ANALYSIS

An over-all impression of the general relationship between the book and tax data can best be gathered by examining first the ratios for the 8-year totals (Table 12). In manufacturing, construction, transportation (except steam railroads), and trade, book profit tends to exceed statutory net income, but by less than 10 percent. The percentage excess for mining companies and public utilities other than transportation is much larger. In steam railroads there is no consistent tendency in either direction.

Several qualifications to this conclusion must be borne in mind. First, the Analysis Z ratios in Table 12 slightly overstate the excess of book profit over statutory net income, probably by 2-3 percent, because of the treatment of income taxes in computing the book profit figures reported on tax returns (Ch. 10, Sec. C2). Moreover, the book profit figure used in Sample III may not be accurate, but the over-all results are probably not seriously out of line. Finally, the statutory net income data were transcribed from unaudited tax returns. The best available evidence is that audit adjustments increased

the statutory net income figure for the 'average' corporation by 3-7 percent in 1929-36.

In the light of these qualifications the finding stated above may perhaps be reworded: for unaudited data, in manufacturing, construction, transportation (except steam railroads), and trade, book profit tends to exceed statutory net income, but by very little. After audit adjustments the two tend to be approximately equal. For mining companies and most public utilities except transportation, book profit is, in general, much larger than statutory net income even after adjustment. For steam railroads, on the contrary, statutory net income, after adjustment, may tend slightly to exceed book profit. As it was not feasible to allow for audit adjustments throughout the compilation and analysis of the Sample III data, further discussion of Sample III findings refers to unadjusted data.

In manufacturing the ratios for 1929-36 for 12 of the 16 industrial groups are within the 0-10 percent range. Moreover, 3 of the remaining 4 groups are barely outside this range; 2 have very small negative ratios and 1 a positive ratio of slightly over 10 percent. One group, the manufacturers of petroleum and other mineral oil products, stands apart from the other manufacturing groups with a book profit more than 50 percent higher than its statutory net income. The explanation is that substantial amounts of gas and oil producing properties are owned and operated by the corporations classified as manufacturers of petroleum and other mineral oil products by the Bureau of Internal Revenue. Differences in the treatment of depletion deductions, and possibly also of intangible drilling costs, undoubtedly account for the very large divergence. In other words, the divergence almost certainly is not attributable in any large degree to the manufacturing activities of the companies.

All the construction and trade groups are within the 0-10 percent range. Two of the 3 service groups, on the contrary, show moderate negative percentages. The data for the service industries, however, are highly erratic and may not be re-

TABLE 12

Analysis Z Ratios for Differences between Book Profit and Statutory Net Income, by Net Income and Deficit Categories, Sample III Corporations, 1929-1936  
(percentages)

	1929	1930	1931	1932	1933	1934	1935	1936	8-Yr. Av. 1929-36 <sup>b</sup>
	P A R T A			A L L S A M P L E			I I I C O R P O R A T I O N S <sup>a</sup>		
<i>Mining &amp; quarrying</i>									
Metal mining	5.2	48.6	22.7	8.5	35.5	-13.5	-22.1	17.1	9.9
Coal mining	27.1	12.6	10.7	18.4	9.2	45.0	-3.9	23.6	16.5
Oil & gas	30.7	11.3	18.6	47.6	50.4	71.8	63.9	101.8	56.3
Other mining	3.9	7.7	9.4	25.1	-4.4	-49.1	-3.5	66.9	0.9
<i>Manufacturing</i>									
Food & kindred products	4.2	3.7	-0.8	10.6	22.2	-1.7	-12.4	6.8	3.0
Liquors & beverages	91.2	-3.6	-4.2	11.2	-4.8	5.0	-0.4	0.6	6.3
Tobacco products	-4.5	2.8	1.7	11.1	8.2	-11.6	-8.0	-3.7	-0.5
Textiles	12.0	13.1	3.1	8.2	13.7	3.1	1.0	6.0	7.8
Clothing	5.8	-3.4	-22.4	-17.0	-7.0	14.6	29.6	13.9	0.1
Leather products	4.0	20.1	1.6	2.7	10.8	6.8	10.2	10.2	8.2
Rubber & related products	7.7	20.4	-51.3	18.5	22.4	-22.1	21.2	-6.2	-0.1
Lumber & wood products	14.0	7.2	4.4	-4.8	20.0	-8.3	-2.4	-4.8	2.6
Paper	5.2	10.8	4.8	5.5	3.5	4.9	2.0	17.6	7.2
Printing & publishing	0.4	1.8	107.9	38.5	15.6	-39.4	-16.4	-0.3	8.2
Petroleum	26.4	40.8	27.7	38.4	68.0	69.4	43.2	94.0	55.1
Chemicals & allied products									
except petroleum	6.3	9.7	18.8	34.9	-12.0	-0.2	2.8	3.4	6.5
Stone, clay & glass	13.2	14.1	6.2	20.1	6.3	8.1	4.5	-0.6	7.9
Iron & steel	16.7	34.5	6.5	-10.0	11.5	-2.5	20.9	20.6	12.9
Motor vehicles, incl. parts	7.2	7.0	-1.8	5.6	11.1	3.6	1.3	-2.2	2.8
Other metal products	-0.4	6.0	30.4	18.3	61.2	19.3	-7.2	2.8	9.9
<i>Construction</i>									
<i>Construction &amp; other pub. ut.</i>	-4.1	5.7	-81.1	8.7	4.3	19.4	14.4	9.8	0.6
<i>Transportation &amp; other pub. ut.</i>									
Steam railroads	-18.8	4.6	7.4	-0.7	6.4	-5.0	2.3	-1.6	-4.1
Other transp. & related industries	-8.3	5.0	9.1	10.4	15.0	13.1	7.5	6.6	6.8

Electric light & power	6.9	23.8	45.3	37.1	41.2	29.0	54.6	51.5	35.2
Gas	18.6	20.5	54.2	67.0	26.4	38.0	66.1	67.8	47.6
Telephone & telegraph	4.9	5.6	12.9	67.5	84.3	4.3	6.6	14.8	17.9
Other public utilities	1.2	15.9	21.1	6.0	18.3	10.9	12.7	16.0	13.1
<i>Trade</i>									
Wholesale	40.4	4.4	-35.1	9.4	-0.4	-6.7	21.3	10.8	8.8
Retail	23.1	15.9	5.7	-4.1	2.4	-2.7	13.9	-1.3	6.7
Other	5.4	17.5	-1.0	10.8	11.8	1.8	3.3	10.0	7.0
<i>Service</i>									
Domestic	0.9	7.0	2.8	-5.3	13.4	-15.9	-35.0	-4.6	-6.9
Amusements	6.5	10.6	-14.5	-23.2	-274.0	-44.4	-23.3	104.9	-15.3
Other	31.1	11.6	27.3	-10.8	1.0	-13.6	-17.9	-8.1	1.8

P A R T B      N E T   I N C O M E   C O R P O R A T I O N S

<i>Mining &amp; quarrying</i>									
Metal mining	5.3	26.7	-0.8	22.1	60.3	-8.1	-27.9	16.0	3.9
Coal mining	42.6	2.6	8.8	22.7	25.4	41.0	-32.1	11.2	12.4
Oil & gas	30.0	11.8	16.0	58.4	25.5	66.4	46.6	71.9	44.8
Other mining	4.2	11.9	-6.1	23.9	15.9	-72.2	-22.3	60.5	-8.4
<i>Manufacturing</i>									
Food & kindred products	4.2	2.7	1.0	12.8	16.9	-2.5	-13.0	3.6	1.9
Liquors & beverages	91.2	-3.6	-3.8	4.3	-4.8	5.0	-0.4	0.6	6.2
Tobacco products	-4.5	3.1	0.8	9.6	7.1	-11.5	-8.0	-3.7	-1.0
Textiles	12.8	8.2	6.6	0.4	9.9	3.0	0.1	5.7	6.6
Clothing	5.8	7.0	-5.5	11.2	4.7	0.6	1.2	14.1	5.7
Leather products	4.2	6.5	6.9	17.6	11.5	1.6	10.3	9.8	8.2
Rubber & related products	8.0	43.7	-82.9	372.3	38.2	-27.0	18.9	-7.0	1.3
Lumber & wood products	10.9	-3.5	-4.2	-19.2	17.7	-53.0	-24.8	0.4	-3.3
Paper	1.7	11.1	10.1	23.9	7.0	4.4	3.6	20.9	8.8
Printing & publishing	0.4	2.0	111.4	16.4	17.3	6.2	-11.5	-0.6	12.1
Petroleum	26.4	21.1	4.9	160.0	131.5	63.9	26.5	85.1	49.9
Chemicals & allied products									
except petroleum	5.0	7.6	16.2	34.3	-3.6	-0.6	1.5	3.5	6.0
Stone, clay & glass	13.4	14.3	18.8	22.9	21.8	6.2	6.7	-1.1	9.0
Iron & steel	16.7	27.2	38.3	-182.8	13.4	-0.1	5.7	20.7	11.2
Motor vehicles, incl. parts	6.5	5.4	-4.4	6.6	4.3	3.0	0.9	-2.4	1.4
Other metal products	-1.4	4.9	-2.2	30.8	98.8	2.1	-12.4	2.2	4.2
<i>Construction</i>									
	-4.1	5.8	-125.4	-18.7	1.2	29.1	17.0	5.7	-15.9

TABLE 12 (concl.)

	1929	1930	1931	1932	1933	1934	1935	1936	8-Yr. Av. 1929-36b
<i>Transportation &amp; other pub. ut.</i>									
Stream railroads	-19.3	3.1	-15.0	-20.1	13.8	2.2	-5.7	-21.2	-11.2
Other transp. & related industries	-11.0	2.2	4.3	0.9	16.8	5.2	17.0	-5.9	1.4
Electric light & power	6.1	22.8	38.5	22.3	33.4	22.7	35.1	39.0	26.6
Gas	18.5	19.7	56.8	75.1	29.7	8.4	36.8	53.4	36.3
Telephone & telegraph	4.9	5.6	10.3	67.5	81.2	1.8	3.8	14.9	16.4
Other public utilities	6.1	4.5	4.4	3.0	6.0	8.6	6.9	6.4	6.4
<i>Trade</i>									
Wholesale	42.0	4.0	3.2	-24.8	-1.5	-8.8	-1.1	3.8	6.4
Retail	22.2	9.4	6.2	-2.2	5.4	3.9	14.2	-1.7	7.8
Other	5.4	20.4	-0.9	22.5	5.1	0.8	-0.7	7.1	5.7
<i>Service</i>									
Domestic	-3.3	8.2	-1.5	-7.9	-5.0	-17.8	-2.0	-24.3	-2.7
Amusements	6.5	10.6	14.0	-15.1	-91.0	-149.2	-24.5	89.6	12.8
Other	6.1	13.6	-2.4	-17.2	-1.6	-18.0	-3.7	2.2	0.9
<i>Mining &amp; quarrying</i>									
Metal mining	-29.3	66.2	26.3	7.8	29.2	-48.8	8.6	72.2	21.2
Coal mining	10.3	27.2	11.5	18.1	6.6	47.9	12.6	28.9	18.5
Oil & gas	36.3	0.1	21.4	31.6	53.5	448.4	129.1	223.0	108.8
Other mining	-0.1	-16.3	47.8	26.2	-18.6	49.2	66.5	110.0	34.1
<i>Manufacturing</i>									
Food & kindred products	7.1	21.0	-10.2	0.8	138.0	43.6	16.0	145.6	22.3
Liquors & beverages	...	-4.2	-5.7	63.0	...	-129.1	0.7	-21.8	8.5
Tobacco products	...	-10.6	46.2	77.3	363.9	-171.2	-81.8	-32.2	46.5
Textiles	7.3	15.1	1.8	9.8	53.3	3.2	11.9	10.1	10.1
Clothing	-10.5	-33.9	-34.0	-22.3	-25.3	62.7	103.5	1.8	-11.4
Leather products	0.4	51.0	-3.4	-15.7	7.0	52.2	4.3	17.4	7.8
Rubber & related products	-3.0	0.4	-17.3	-9.8	-21.6	26.6	38.0	30.4	-4.2
Lumber & wood products	38.9	9.7	4.9	-4.7	20.3	8.9	16.6	-13.6	5.4

## PART C DEFICIT CORPORATIONS

Paper	75.1	9.9	1.1	3.4	0.6	5.9	-2.4	-1.3	4.2
Printing & publishing	1.7	-11.1	48.6	79.6	-1.8	-108.2	-187.4	9.2	-31.5
Petroleum	...	169.3	30.6	60.7	48.6	84.8	92.2	166.7	66.3
Chemicals & allied products									
except petroleum	294.0	56.3	55.5	37.0	-33.4	37.6	178.9	-0.6	16.7
Stone, clay & glass	-0.1	2.6	-12.9	19.4	-23.5	21.0	-11.5	18.2	2.3
Iron & steel	22.1	46.2	4.7	12.0	11.3	-4.0	55.9	19.4	15.2
Motor vehicles, incl. parts	105.0	54.6	4.5	5.6	51.9	8.7	47.2	24.1	11.6
Other metal products	106.8	18.7	58.4	13.4	2.9	85.8	73.4	37.1	37.7
Construction	-4.3	0.6	-20.0	10.6	14.1	10.7	8.2	25.4	9.0
Transportation & other pub. ut.									
Steam railroads	81.3	30.4	19.8	3.3	4.7	-7.2	6.0	15.5	6.4
Other transp. & related industries	34.0	42.0	26.2	33.4	11.0	42.6	3.2	35.4	21.4
Electric light & power	111.9	222.1	539.7	199.4	167.1	192.7	331.8	301.0	253.8
Gas	20.2	25.8	12.0	30.0	17.4	121.3	129.8	159.5	97.1
Telephone & telegraph	...	...	201.0	68.3	25.9	149.7	183.3	9.5	130.9
Other public utilities	-226.6	90.7	107.0	14.5	57.2	34.3	64.9	103.4	58.0
Trade									
Wholesale	31.5	6.8	-95.6	48.2	5.2	11.4	108.9	98.4	18.9
Retail	87.0	77.0	4.6	-6.3	-11.6	-134.8	1.7	19.6	-2.2
Other	2.6	6.5	-1.0	5.4	30.7	7.8	38.3	35.7	11.4
Service									
Domestic	37.0	-3.9	14.6	-3.6	19.7	-15.1	-41.2	0.9	-10.7
Amusements	...	...	-65.8	23.3	280.0	68.7	-0.8	143.6	-63.4
Other	324.3	-7.8	42.9	-8.6	2.3	-2.0	-33.8	-21.0	3.2

A positive percentage indicates that the book profit figure exceeds the statutory net income figure; a negative percentage indicates the opposite relationship.

a In assembling Part A algebraic signs were ignored in combining book profit and loss data and in combining statutory net income and deficit data for purpose of computing the denominators of the ratios, but were taken into account in computing the numerators (see Ch. 11, Sec. C).

b The 8-year average figures represent weighted aggregates. The total divergences between book profit and statutory net income for each year were added to obtain the numerators of the 8-year average ratio; the denominators represent the sum of the statutory net income figures reported for each of the 8 years. (Algebraic signs are treated as described in note a.)

liable. They are based on a relatively small sample of corporations representing an industry in which the corporate form of organization is not predominant.

In contrast to all the above groups, some mining and public utility groups typically report much larger book profits than statutory net incomes. In oil and gas mining, for instance, the Analysis Z ratio for the 8-year totals is over 50 percent. The extremely generous percentage depletion charges allowed for tax purposes undoubtedly account for most of this excess. The remaining mining groups also report ratios which are positive but not as large.

Electric power and light and gas companies have Analysis Z ratios of 35 and 48 percent, respectively, for the 8 years. Telephone and telegraph companies and other public utilities have ratios that center around 15 percent. In all probability, differences in the procedures used for charging off fixed assets constitute a major explanation for these divergences. Another important factor, in some years at least, is differences in accounting for interest expenses, especially on the retirement or refunding of outstanding securities; indeed, for Sample I corporations in 1936 such differences were the largest single source of divergence.

The data for individual years reveal a much higher degree of industry-to-industry variation than the 8-year totals; they also reveal marked variations from year to year within an industry. These variations are especially pronounced in industrial groups represented in the sample by a relatively small number of companies as, for example, the liquors and beverages group in 1929 or the construction group in 1931. These extreme variations should not be regarded as of great importance. In some instances they may reflect inaccuracies in the basic data from which the sample was compiled; as already emphasized, the figure for book profit reported on the income tax return may occasionally be misleading. In other instances extreme percentages may be caused by unusually large divergences in the data reported by one or two companies. Such



instances distort the representativeness of the sample data, and stress the fact that extreme divergences may occur for a variety of reasons in any industry.

Over 80 percent of the annual ratios for the manufacturing groups, excluding the petroleum group, are within the +20 to -20 percent range (Table 13). Of 120 ratios, only 17 exceed +20 percent and only 5 are algebraically less than -20 percent. On the other hand, in all 8 years the petroleum refining group has a ratio higher than +20 percent. The oil and gas producers group has a positive ratio each year; in 6 it exceeds +20 percent. Likewise, the gas, and electric light and power groups each has a positive ratio for all 8 years; in 7 it exceeds +20 percent. In other words, although greater variation appears when the year-to-year ratios are examined, the general trend shown by the 8-year totals is evident.

Deficit companies tend to have larger ratios than income companies (Table 12, Parts B and C). That is to say, the percentage by which book profits exceed statutory net incomes tends to be smaller than the percentage by which statutory deficits numerically exceed book losses, both percentages being based on the statutory figures. In 24 of the 33 industrial groups the deficit companies have larger Analysis Z ratios than the income companies over the 8 years. In every year except 1933 they have larger group ratios in a majority of the 33 industrial groups. These findings may indicate that the desire to minimize book losses in poor years is stronger than the desire to maximize book profits in prosperous years. While we cannot pursue the subject here, it seems to demand further investigation.

No noticeable correlation has been discovered between the size of company and the relationship between book profit and statutory net income. Though an exhaustive investigation was not feasible, examination of the over-all data in Table 20 failed to reveal any systematic relationship, as did an inspection of working charts prepared for individual industries.

Pronounced cyclical changes in book profit and statutory

TABLE 13  
 Frequency Distribution of Annual Analysis Z Ratios, for Differences between Book Profit and Statutory Net Income, Industry Averages, Sample III Corporations, 1929-1936

	ANALYSIS Z RATIO (PERCENTAGES)			
	-20 & under	zero to -19.99	zero to 19.99	20 & over
Mining & quarrying	2	4	12	14
Metal mining	1	1	3	3
Coal mining	0	1	4	3
Oil & gas	0	0	2	6
Other mining	1	2	3	2
Manufacturing	4	30	70	24
Food & kindred products	0	3	4	1
Liquors & beverages	0	4	3	1
Tobacco products	0	4	4	0
Textiles	0	0	8	0
Clothing	1	3	3	1
Leather	0	0	7	1
Rubber	2	1	2	3
Lumber & wood products	0	4	4	0
Paper	0	0	8	0
Printing	1	2	3	2
Petroleum	0	0	0	8
Chemicals & allied prods. except petroleum	0	2	5	1
Stone, clay & glass	0	1	6	1
Iron & steel	0	2	3	3
Motor vehicles	0	2	6	0
Other metal products	0	2	4	2
Construction	1	1	6	0
Transportation & other pub. ut.	0	5	26	17
Steam railroads	0	4	4	0
Other transp. & related industries	0	1	7	0
Electric light & power	0	0	1	7
Gas	0	0	1	7
Telephone & telegraph	0	0	6	2
Other public utilities	0	0	7	1
Trade	1	6	14	3
Wholesale	1	2	3	2
Retail	0	3	4	1
Other	0	1	7	0
Service	5	8	8	3
Domestic	1	3	4	0
Amusements	4	1	2	1
Other	0	4	2	2

net income occurred in the period covered by our data. From 1929 to 1932 both the book profit and statutory net income of all corporations declined, and from 1932 to 1936 both rose. How was the relationship between them affected?

Unfortunately, the sample is not well designed for testing cyclical variations in this relationship, and the interval covered is too short for a conclusive test. Inasmuch as the sample is not made up of the same companies in all years, it is difficult to determine what part of the year-to-year variations in the relationship is attributable to cyclical influences and what part to changes in the sample. Likewise, since the data cover only one business cycle the stability of any cyclical pattern from cycle to cycle cannot be tested.

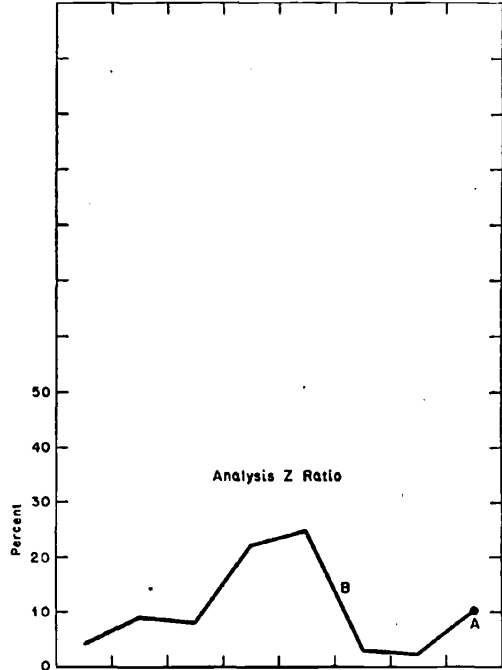
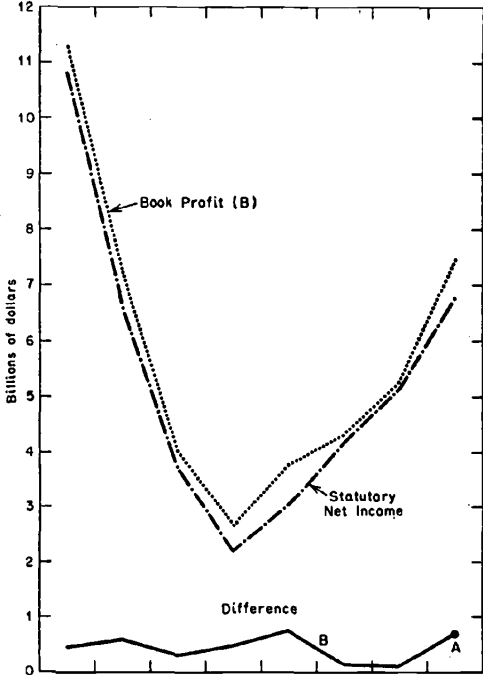
Nevertheless, it is worth while to examine the data for evidence of cyclical variations. Turning first to the figures for all industries combined (Chart 2) we find little evidence of cyclical change in the dollar magnitude of the difference between book profit and statutory net income. True, for corporations showing statutory net deficits the discrepancy tends to decline as deficits grow (1929-32) and to rise as they decline (1932-36). Book losses were decidedly smaller than statutory deficits in 1929, 1930, and 1936, while the two were about the same in 1933 and 1934. However, for income corporations and for the income and deficit groups combined, the dollar discrepancies fluctuate irregularly, giving little indication of a cyclical pattern.

Among the industry groups, cyclical patterns in the dollar excess of book profit over statutory net income are reasonably clear only in the trade and service categories. Here the differences, whether for income or for deficit corporations, seem to diminish as income falls and to rise as income rises.

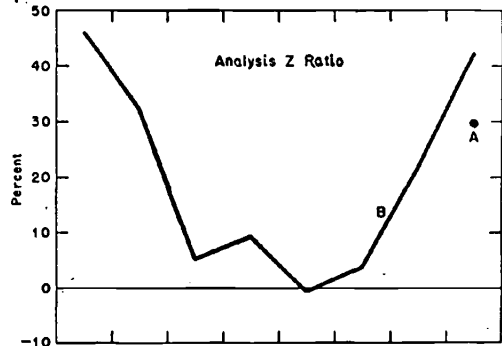
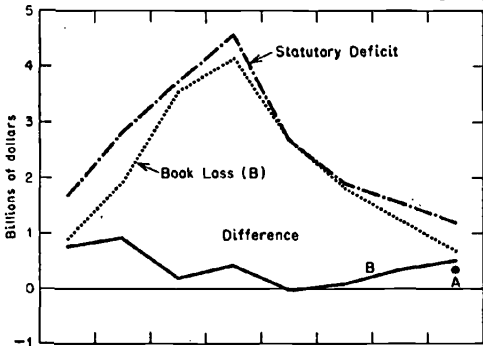
In contrast to the dollar figures, the Analysis Z ratios show fairly pronounced cyclical tendencies for income and deficit corporations separately but not for all corporations taken as a unit (Chart 2). Owing to the cyclical stability of the numerator (the excess of book profit) and the marked cyclical variation in the denominator (statutory net income) the Analysis Z ratios for income corporations tend to rise in business contractions and fall in expansions; contrariwise, those for deficit corporations tend to fall in business contractions and rise in

CHART 2  
 Differences between Book Profit and Statutory Net Income  
 Weighted by Methods A, B, and C, All Corporations, 1929-1936

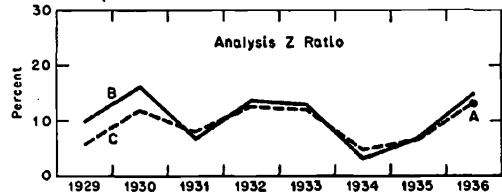
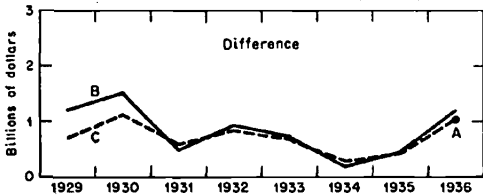
Net Income Corporations



Deficit Corporations



Net Income and Deficit Corporations



expansions. But the Analysis Z ratios for income and deficit corporations combined fluctuate irregularly over the cycle, for here the denominator is the numerical sum of deficits and incomes, and the cyclical fluctuations in the two tend to offset each other.

As Chart 2 suggests, and as we have already noticed, the ratios for deficit corporations tend to be larger than for income corporations over the cycle as a whole. But at the bottom of depression the reverse is true. Then the relative excess of book profit over statutory net income for income corporations is at its peak, while the relative excess of statutory deficit over book loss for deficit corporations is at a minimum.

These patterns in the Analysis Z ratios for all corporations are repeated more or less faithfully in the group ratios for mining, manufacturing, and transportation and other public utilities.<sup>1</sup> The ratios for the construction group do not show a clear cyclical pattern, while those for the trade and service groups show a decline in years of business contraction and a rise in years of expansion, in the case of both income and deficit corporations.

<sup>1</sup> In the transportation and other public utilities group the cyclical pattern is due primarily to the heterogeneous character of the industrial group rather than to relationships that are repeated in the various industries comprising the group.

The Analysis Z ratios for railroads are typically much smaller than those for gas and electric light and power companies. Furthermore, during the depression years most railroads reported deficits while other public utilities were predominantly in the income category. In 1932 and 1933, as a result of these two relationships, the deficit companies in the broad group, transportation and other public utilities, have much smaller Analysis Z ratios than the income companies. In 1932 especially, if a narrower industrial classification had been used, the deficit ratio for the broad group would have substantially exceeded the income ratio. Thus, the cyclical pattern for the group as a whole is attributable almost entirely to its heterogeneous character; when the six individual subgroups are examined, the cyclical relationships are much less pronounced, appearing in fact in only moderate degree for two subgroups, gas companies and steam railroads.

The manufacturing subgroups typically do not show the regular cyclical pattern characteristic of the major group; moreover, the outstanding features of the all manufacturing group—the large deficit ratios for 1929 and 1936 and the relatively large income ratios for 1932 and 1933—are, in each instance, largely caused by a very few subgroups.

All the above statements concern the behavior of group averages. An equally important consideration is the dispersion of individual companies about their group averages. Frequency distributions were prepared for the 33 industrial groups for 1936 to illustrate the types of dispersion; Chart 3 presents these distributions for 8 representative groups. Four of the subcharts illustrate industrial groups in which book profit and statutory net income for the group average differ by only a small percentage, and four have rather a large percentage of high positive ratios.<sup>2</sup>

The Analysis X ratios of approximately 70 percent of the total number of companies in the manufacturing, trade, and service groups are within the plus to minus 20 percent range. Ten to 16 percent of the ratios in these 3 groups lie beyond each side of this range. Well over half of the companies in the oil and gas mining, petroleum refining, and gas and electric light and power utilities groups, in contrast, have ratios exceeding +20 percent (Tables 14 and 15).

To what extent are divergences between book profit and statutory net income consistent from year to year? That is, do corporations typically report a book profit larger (or smaller) than their statutory net income, or is there a tendency for differences to cancel out over a period of years?

Differences between the two figures tend to balance out for a substantial number of companies (Table 16). In manufacturing, trade, and service, for instance, the book profit of 40 percent of the companies exceeded statutory income in not more than 5 or fewer than 3 years. Book profit of many companies, though, tended to exceed statutory net income in most years. For instance, in over 60 percent of the mining and transportation and other public utility companies book profit exceeded statutory net income in 6 or more of the 8 years. On the other hand, statutory net income consistently exceeded book profit

<sup>2</sup> The secondary mode around +15 percent, apparent in several parts of Chart 3, is to be expected in view of the double adjustment for the federal income taxes of some corporations.

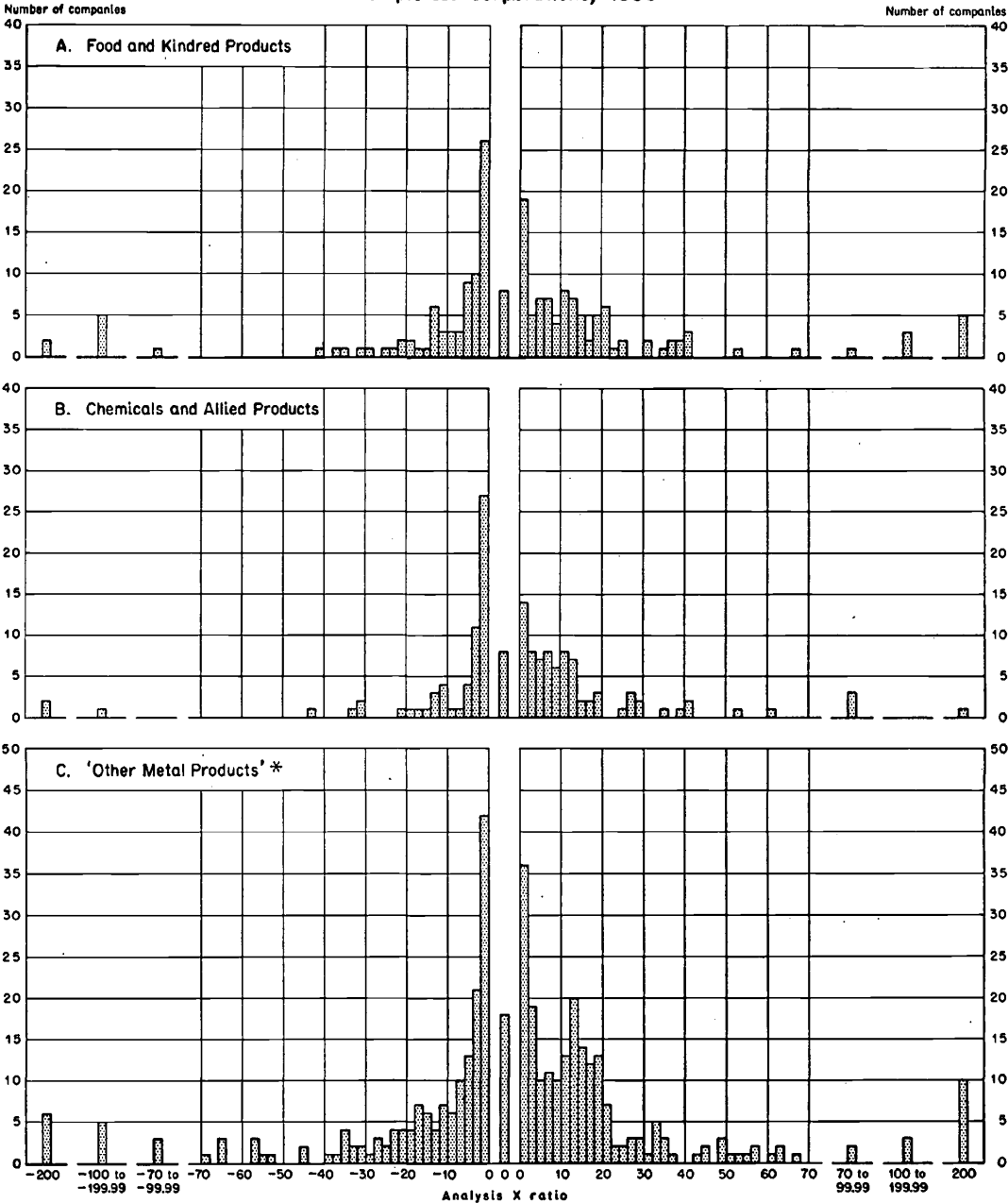
for a much smaller percentage of companies. Except for the service group, fewer than 20 percent of the companies in each industrial group reported larger statutory net incomes in 6 or more years.

The discussion to this point has stated no conclusions with respect to the size of the Analysis Z ratio for the entire universe or for major industrial groups, such as all manufacturing activity. Over-all averages computed from Sample III might have given misleading results inasmuch as the sample includes a much larger percentage of the universe in some industries, income or deficit categories, and size classes, than in others. Weighted averages were therefore computed in the hope that they would improve the reliability of the Analysis X ratios for the universe and for major industrial groups.

The appropriate weighting procedure was difficult to select. Theoretically, adjustments should be made for an uneven representation of size classes, of income and deficit categories, and of industrial groups. The importance of the adjustment for uneven representation of size classes is, however, minimized by the absence of any pronounced influence of size on the Analysis Z ratios. Actually, estimates using this three-way classification could be prepared only for 1936.<sup>3</sup> Estimates were prepared also for all 8 years in which first the size classi-

<sup>3</sup> The three-way classification, defined as Method A, could be applied only to 1936, since a change in the definition of 'net income' used in *Statistics of Income* to segregate net income companies from deficit companies made it inapplicable to 1935 and earlier years. In these years dividends received on the stock of domestic corporations subject to the corporation income tax and certain tax-exempt interest were excluded from net income; hence, some companies are classified in the deficit category in *Statistics of Income* and in the income category in Sample III. This difference is of sufficient magnitude in the large asset classes to destroy the usefulness of Method A. It impairs also somewhat the validity of Methods B and C, but probably not sufficiently to change greatly the results derived from them. The change in definition impairs the weighting procedures only as it affects the net income-deficit classification. For both net income and deficit companies in *Statistics of Income*, data are available on compiled net profit or net loss in 1929-35, and were used in Methods B and C. Compiled net profit in these early years is approximately equivalent to 'net income' as defined in *Statistics of Income* for 1936.

**CHART 3**  
**Frequency Distribution of Analysis X Ratios**  
**for Book Profit and Statutory Net Income**  
**Sample III Corporations, 1936**



\* Excludes corporations classified as 'iron and steel' and as 'motor vehicles including parts'.



CHART 3 (concl.)

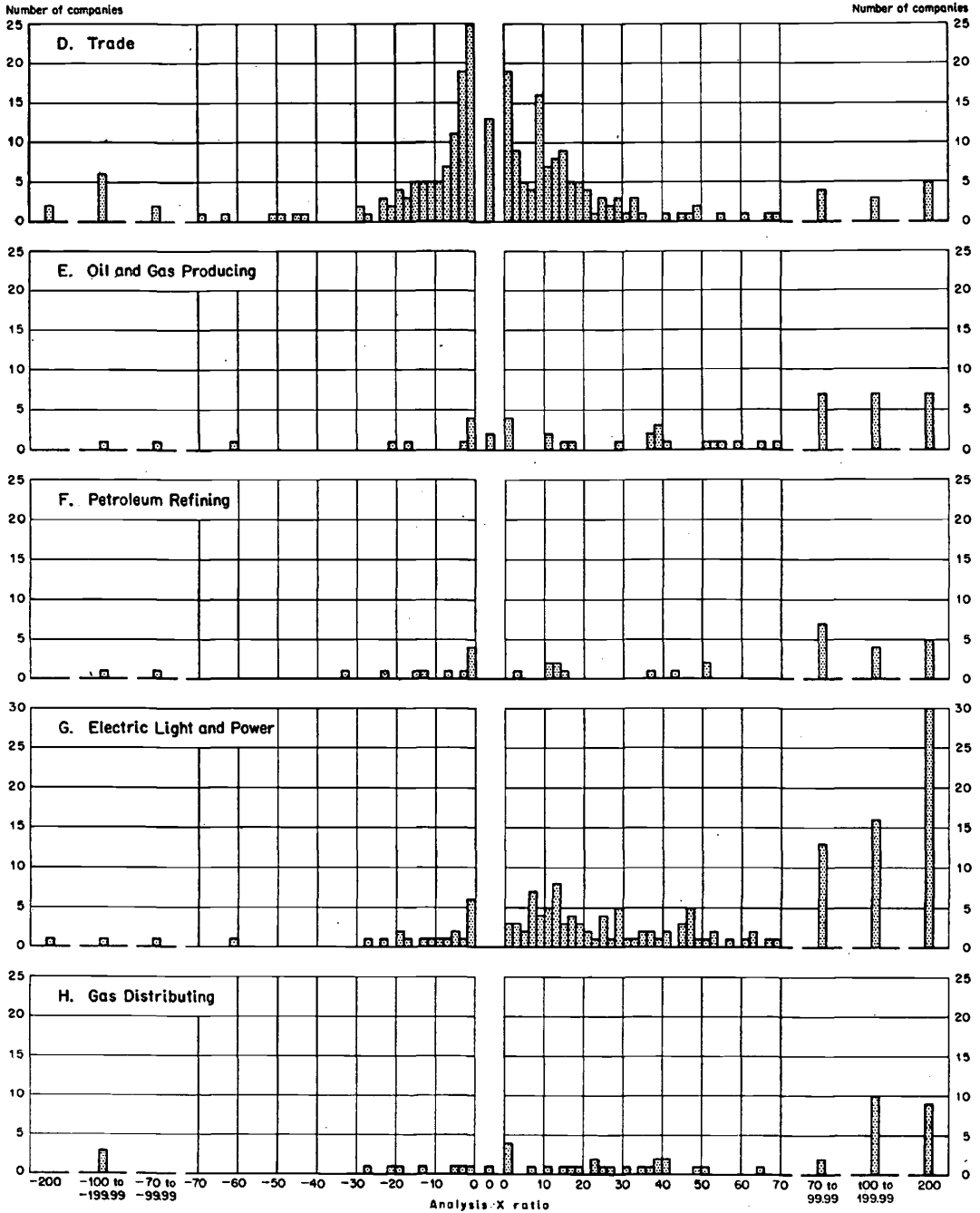


TABLE 14  
 Frequency Distribution of Analysis X Ratios for Differences between Book Profit and Statutory Net Income  
 Sample III Corporations, 1936

	ANALYSIS X RATIO (PERCENTAGES)										Total
	Below zero to					Above zero to					
	-100 & under	-50 to -99.99	-20 to -49.99	zero to -19.99	Zero	19.99 zero to	20 to 49.99	50 to 99.99	100 & over		
	NUMBER OF CORPORATIONS										
<i>Mining &amp; quarrying</i>		11	14	35	23	47	33	25	31	228	
Metal mining	2	0	2	9	2	7	6	4	3	35	
Coal mining	4	8	7	10	14	18	10	5	9	85	
Oil & gas	1	2	1	6	2	8	7	13	14	54	
Other mining	2	1	4	10	5	14	10	3	5	54	
<i>Manufacturing</i>	62	35	89	511	71	594	126	58	70	1,616	
Food & kindred products	7	1	9	64	8	69	19	3	8	188	
Liquors & beverages	1	0	4	19	4	15	6	1	1	51	
Tobacco products	0	0	1	5	0	7	1	0	0	14	
Textiles	13	5	13	55	4	68	25	4	11	198	
Clothing & apparel	2	1	4	11	0	13	2	4	0	37	
Leather	1	0	1	14	2	14	4	0	2	38	
Rubber & wood products	1	1	2	12	0	8	2	1	1	28	
Lumber	5	6	4	33	11	28	4	2	8	101	
Paper	4	1	5	35	3	29	3	4	6	90	
Printing	5	4	2	30	7	49	3	2	1	103	
Petroleum	1	1	1	8	0	6	2	9	9	38	
Stone, clay & glass	3	0	5	54	8	65	10	5	1	151	
Iron & steel	4	1	2	17	1	26	4	6	4	65	
Chemicals & allied products	3	1	5	24	4	32	7	5	3	84	
Motor vehicles, incl. parts	1	1	4	10	1	7	1	1	2	28	
Other metal products	11	12	26	120	18	158	33	11	13	402	

<i>Construction</i>	4	1	8	19	10	23	10	4	6	85
<i>Transportation &amp; other pub. ut.</i>	23	11	21	102	16	181	69	45	121	589
Steam railroads	4	1	6	24	3	26	5	5	13	87
Other transp. & related industries	10	6	10	32	10	62	9	5	26	170
Electric light & power	2	2	2	16	0	42	31	22	46	163
Gas	3	0	2	5	1	9	12	4	10	55
Telephone & telegraph	0	1	0	5	0	22	5	2	6	41
Other public utilities	4	1	1	20	2	20	7	7	11	73
<i>Trade</i>	18	15	34	222	32	247	56	17	23	664
Wholesale	5	8	15	37	13	98	25	4	8	263
Retail	8	5	11	89	13	87	23	8	8	252
Other	5	2	8	46	6	62	8	5	7	149
<i>Service</i>	13	7	14	62	30	51	9	8	16	210
Domestic	10	3	6	39	25	20	7	6	10	126
Amusement	0	1	3	4	1	20	1	1	4	35
Other	3	3	5	19	4	11	1	1	2	49

TABLE 15  
 Percentage Distribution of Analysis X Ratios for Differences between Book Profit and Statutory Net Income  
 Sample III Corporations, 1936

	ANALYSIS X RATIO (PERCENTAGES)										Total
	Below					Above					
	-100 & under	-50 to -99.99	-20 to -49.99	zero to -19.99	Zero	Zero	19.99	20 to 49.99	50 to 99.99	100 & over	
Mining & quarrying	4	5	6	15	10	21	14	11	14	100	
Manufacturing	4	2	5	32	4	37	8	4	4	100	
Construction	5	1	9	22	12	27	12	5	7	100	
Transportation & other pub. ut.	4	2	3	17	3	31	12	8	20	100	
Trade	3	2	5	33	5	37	8	3	4	100	
Service	6	3	7	30	14	24	4	4	8	100	

TABLE 16

Number of Years in which Book Profit Exceeds Statutory Net Income, Sample III Corporations, 1929-1936

	8 years	7 years	6 years	5 years	4 years	3 years	2 years	1 year	None
<i>Mining &amp; quarrying</i>	14	15	10	8	8	2	0	2	1
Metal mining	2	2	1	3	3	0	0	0	0
Coal mining	4	4	5	3	4	1	0	1	1
Oil & gas	3	5	2	0	0	0	0	1	0
Other mining	5	4	2	2	1	1	0	0	0
<i>Manufacturing</i>	95	83	86	90	75	77	63	20	16
Food & kindred products	9	9	9	11	11	9	10	1	3
Liquors & beverages	0	0	0	0	1	2	2	1	0
Tobacco products	2	3	1	1	2	0	2	0	1
Textiles	7	9	10	10	11	9	8	3	0
Clothing & apparel	2	2	3	2	1	1	2	1	0
Leather products	1	2	2	2	2	3	1	1	1
Rubber & related products	3	0	1	6	2	3	2	0	1
Lumber & wood products	3	1	2	4	4	4	2	0	1
Paper	7	5	7	9	8	6	4	5	1
Printing & publishing	6	11	6	7	7	6	8	0	1
Petroleum	3	2	4	0	2	1	1	0	1
Chemicals & allied products, except petroleum	15	6	11	11	3	6	5	1	2
Stone, clay & glass	3	6	5	2	3	3	2	2	0
Iron & steel	7	6	5	1	4	7	2	0	0
Motor vehicles, incl. parts	1	3	2	3	1	2	1	3	0
Other metal products	26	18	18	21	13	15	11	2	4
<i>Construction</i>	1	0	2	1	3	2	0	1	0
<i>Transportation &amp; other pub. ut.</i>	55	42	31	17	24	14	8	9	7
Steam railroads	8	14	6	1	9	4	4	1	1
Other transp. & related indust.	17	14	13	6	6	6	3	6	4
Electric light & power	19	5	6	2	3	0	0	1	0
Gas	2	3	3	3	1	3	0	1	0
Telephone & telegraph	6	3	1	0	2	1	1	0	0
Other public utilities	3	3	2	5	3	0	0	0	2
<i>Trade</i>	22	14	19	33	27	18	16	8	5
Wholesale	5	4	8	14	11	6	4	3	3
Retail	10	6	8	12	9	10	6	5	1
Other	7	4	3	7	7	2	6	0	1
<i>Service</i>	4	3	3	6	4	9	10	5	2
Domestic	4	3	1	4	2	6	9	4	2
Amusements	0	0	1	0	1	3	0	1	0
Other	0	0	1	2	1	0	1	0	0

fication, then both the size and the income-deficit categories were dropped. For convenience of future reference, the three-way classification is designated Method A, the two-way classification Method B, and the weighting by industrial groups alone Method C.

These estimates were made as follows. Under Method A the sample data for statutory net income and the excess of book profit over statutory net income were first cross-classified by size, income-deficit, and industrial categories. Each cell resulting from this three-way classification was 'blown up' by multiplying the sample data for the excess of book profit over statutory net income by the ratio of the universe statutory net income for that cell to the statutory net income included in the sample. The products were then totaled and group ratios computed. The same procedure was followed for Methods B and C except that broader cells were used as first the size classification, then both the size classification and the income-deficit category were abandoned.

Net incomes of all corporations were taken from *Statistics of Income*. The necessity of following the industrial groups, size classification, and income-deficit categories of *Statistics of Income* in order to compare the sample data with its data raised several difficult problems.

First, the industrial groups of *Statistics of Income* in the years covered are more inclusive than is desirable, especially in nonmanufacturing industries. The lumping of all corporations engaged in transportation and other public utilities into one group led to some highly misleading results, as explained above. In no other instance has the industrial grouping distorted the weighted results to a comparable degree.

A second element of unreliability is introduced into the weighted results by the small coverage of the sample in some cells. This difficulty is especially pronounced when Method A is applied. To cite an extreme illustration, the stone, clay and glass products group has an Analysis Z ratio of  $-17.5$  when Method A is used but ratios of  $+0.7$  and  $-0.6$  with the other

two weighting procedures. The large negative ratio under Method A is attributable primarily to a single company with a statutory deficit of approximately \$18,000 and a book profit of \$157,000. This one extreme item happens to be the only deficit company of the sample in the \$1-5 million asset class and represents less than 1 percent of the total statutory deficit reported in *Statistics of Income* for this asset class. Weighted by Method A, this extreme item is magnified more than 100 times in its effect on the industry average. As a result this single company, although actually of inconsequential significance, accounts for more than 80 percent of the deficit ratio under Method A. When Methods B and C are followed, however, it is merged with the other deficit companies in the group and has a negligible influence on the results.

Table 17 compares the Analysis Z ratios computed by the three weighting procedures in 1936 and by Methods B and C, 1929-35. Table 18 shows the estimated excess of book profit over statutory net income from which Table 17 was prepared. Tables 19 and 20 present Analysis Z ratios classified by net income-deficit categories and by asset size classes. Table 17 indicates that the instance just cited represents the most extreme variation among the three methods in 1936. Some of the smaller variations in other groups also can be attributed to the effect of a few isolated items. It is, therefore, not safe to assume that in all industrial groups the results are progressively improved by more refined weighting techniques.

Most of the wide variations in specific industrial groups disappear when the over-all results are examined. In 1936, for instance, when it was feasible to apply all three weighting methods, less than two percentage points separate the results of the three methods for all corporations from which the sample was drawn, and less than one percentage point separates the three averages for the all manufacturing group. Methods B and C in 1935 and all earlier years except 1929 and 1930 give comparable results. In 1929 and 1930 the ratios are larger by several percentage points under Method B than under C;

TABLE 17  
 Estimates of Analysis Z Ratios for Corporate Universe Covered by Sample III Weighted by Methods A, B, and C  
 (percentages)

	1 9 2 9			1 9 3 0			1 9 3 1			1 9 3 2			1 9 3 3			1 9 3 4			1 9 3 5			1 9 3 6		
	Weighted by Method B	Weighted by Method C	Weighted by Method A	Weighted by Method B	Weighted by Method C	Weighted by Method A	Weighted by Method B	Weighted by Method C	Weighted by Method A	Weighted by Method B	Weighted by Method C	Weighted by Method B	Weighted by Method C	Weighted by Method A	Weighted by Method B	Weighted by Method C	Weighted by Method B	Weighted by Method C	Weighted by Method A	Weighted by Method B	Weighted by Method C	Weighted by Method B	Weighted by Method C	
<i>Mining &amp; quarrying</i>	11.8	11.4	30.4	24.3	17.4	15.0	25.2	24.8	15.4	11.1	8.6	4.8	37.5	49.9	44.2									
<i>Manufacturing</i>																								
Food & kindred products	11.7	7.2	14.4	10.6	16.0	15.4	23.0	20.6	6.4	4.8	-0.1	0.5	8.8	9.8	8.9									
Liquors & beverages	7.3	7.3	4.9	3.0	8.5	10.7	42.1	22.3	2.9	-1.7	-10.2	-12.4	8.5	14.3	6.8									
Tobacco products					3.0	-1.2	-4.1	-4.8	-11.3	5.0	-0.2	-0.4	6.8	-0.9	0.6									
Textiles					2.4	1.7	63.3	8.2	-14.4	-11.6	-8.7	-8.0	-3.8	-3.9	-3.8									
Clothing & apparel	10.1	10.9	11.7	11.2	-1.6	-1.0	14.1	11.4	5.5	4.3	7.5	3.8	7.5	6.7	6.0									
Leather products	3.0	4.0	38.6	26.1	0.0	1.6	10.2	10.8	17.2	6.8	9.5	10.2	15.0	11.3	10.2									
Rubber & related products	4.0	7.7	10.7	20.4	-37.7	-51.4	17.2	22.4	-12.2	-22.1	21.9	21.2	-2.5	-5.6	-6.5									
Lumber & wood products	19.7	14.0	7.0	7.2	4.2	4.4	19.8	20.0	-8.5	-0.8	-2.7	-2.4	0.7	-3.3	-4.8									
Paper	10.3	5.2	10.8	10.8	5.4	4.8	4.6	3.5	4.8	4.9	2.4	2.0	15.3	18.3	17.6									
Printing & publishing	0.6	0.4	-0.4	1.8	90.3	107.8	10.0	15.6	-27.0	-29.4	-41.4	-16.4	3.5	0.6	-0.3									
Petroleum	23.7	12.7	29.2	19.0	22.6	21.2	17.5	16.7	21.8	18.7	10.6	15.8	84.9	90.7	94.2									
Stone, clay & glass	11.2	13.2	10.1	14.1	-0.8	6.2	-4.7	6.3	11.2	8.1	2.6	4.4	3.6	3.3	3.4									
Chemicals & allied products	8.9	3.5	13.7	9.1	18.9	13.8	28.9	36.1	13.5	10.9	2.5	-0.8	6.5	6.9	6.1									
Metal products, excl. motor ve.																								
Motor vehicles, incl. parts																								
<i>Construction</i>	-4.1	-4.1	4.1	5.7	-71.6	-81.1	10.9	4.3	17.6	19.4	12.8	14.4	14.2	12.1	9.8									
<i>Transportation &amp; other pub. ut.</i>	-5.8	-8.3	15.8	12.7	18.1	17.9	31.3	31.6	9.6	9.6	17.1	20.8	23.0	18.2	18.2									
<i>Trade</i>	27.8	25.2	23.2	13.0	-14.9	-6.3	2.3	3.4	-13.1	-3.1	23.7	13.5	3.3	9.2	3.5									
<i>Service</i>	25.3	6.9	4.5	9.3	-7.6	-2.2	-109.2	-107.3	-15.6	-2.1	-30.8	-21.4	21.7	37.1	36.0									
<i>All corporations<sup>a</sup></i>	9.7	5.7	16.0	11.9	6.6	8.0	12.8	12.0	3.2	4.8	6.7	6.6	13.0	14.9	13.1									

<sup>a</sup> See Table 3, note.



TABLE 18  
Estimated Excess of Book Profit over Statutory Net Income, Methods A, B, and C  
(millions of dollars)

	1 9 2 9		1 9 3 0		1 9 3 1		1 9 3 2		1 9 3 3		1 9 3 4		1 9 3 5		1 9 3 6		
	Method B	Method C	Method B	Method C	Method B	Method C	Method B	Method C	Method B	Method C	Method B	Method C	Method B	Method C	Method A	Method B	Method C
<i>Mining &amp; quarrying</i>	79.4	76.8	133.6	106.7	70.8	68.8	57.4	49.5	75.8	74.5	43.4	31.2	25.8	14.2	147.1	194.9	172.8
<i>Manufacturing</i>																	
Food & kindred products	748.8	453.9	655.8	484.2	477.4	460.2	492.8	474.9	599.0	536.3	172.6	130.8	-2.6	16.8	363.1	404.6	364.8
Liquors & beverages	58.2	58.3	37.1	22.9	-16.2	-6.6	34.0	42.6	151.3	79.9	10.9	-6.4	-41.8	-50.9	36.3	61.1	29.2
Tobacco products					3.7	2.6	17.9	16.9	-3.5	-4.1	-12.4	5.5	-0.2	-0.5	12.3	-1.6	1.0
Textiles									58.0	7.5	-15.7	-12.5	-10.3	-9.5	-4.9	-5.1	-4.8
Clothing & apparel	50.1	54.1	55.5	52.8	-6.3	-4.0	13.5	13.3	42.5	34.4	14.5	11.5	20.6	10.3	19.2	17.1	15.3
Leather products	3.5	4.6	34.5	26.8	...	1.5	-5.8	2.1	7.0	7.4	9.3	3.7	5.4	5.7	5.1	8.1	9.4
Rubber & related products	4.3	8.3	7.9	15.0	-18.7	-25.6	8.1	6.8	3.7	4.8	-2.9	-5.2	9.2	8.9	-1.4	-3.1	-3.6
Lumber & wood products	41.5	29.4	13.1	13.5	8.5	8.9	-10.6	-9.9	22.5	22.7	-8.7	-0.8	-2.5	-2.2	0.8	-3.8	-5.6
Paper	17.2	8.8	10.6	10.6	4.6	4.2	6.8	5.1	4.0	3.1	5.2	5.3	2.9	2.5	20.4	23.6	22.7
Printing & publishing	1.8	1.3	-1.0	5.0	165.9	197.9	77.7	57.6	12.8	20.0	-48.9	-53.1	-77.3	-30.6	7.3	1.3	-0.5
Petroleum	314.8	168.5	276.5	179.8	131.2	123.1	227.8	228.2	89.8	85.6	97.2	83.4	58.2	86.4	197.0	210.5	218.7
Chemicals & allied products	22.7	26.8	15.3	21.2	-1.0	7.3	23.7	24.0	-4.3	5.8	11.4	8.2	3.4	5.8	17.6	16.0	16.6
Stone, clay & glass	229.7	93.7	206.3	136.4	208.8	150.9	99.8	88.2	215.3	269.2	112.6	91.4	29.8	-9.3	75.1	79.8	70.4
Metal products, excl. motor ve. Motor vehicles, incl. parts															-2.2	-7.6	-9.4
<i>Construction</i>	-10.8	-10.7	10.6	14.6	-122.7	-139.1	7.6	13.4	10.8	4.3	16.1	17.7	12.6	14.2	14.9	12.7	10.3
<i>Transportation &amp; other pub. ut.</i>	-179.7	-255.3	359.3	290.5	302.5	298.4	376.6	373.8	443.8	447.7	153.9	153.9	271.3	329.2	378.3	300.1	299.3
<i>Trade</i>	449.9	407.4	327.6	133.9	-210.7	-89.3	67.2	22.4	20.7	30.6	-132.1	-31.3	255.8	146.0	42.6	118.1	44.5
<i>Service</i>	132.4	35.2	20.0	41.5	-25.4	-7.4	-85.2	-84.4	-417.9	-410.9	-57.8	-7.8	-113.0	-78.2	94.2	161.3	156.7
<i>All corporations<sup>a</sup></i>	1,215.0	707.2	1,506.8	1,121.3	491.8	591.7	916.4	849.7	732.1	682.5	196.1	294.6	449.9	442.2	1,040.3	1,191.6	1,048.3

<sup>a</sup> See Table 3, note.

TABLE 19

Estimates of Analysis Z Ratios for Corporate Universe Covered by Sample III, Weighted by Method B, by Net Income and Deficit Categories, 1929-1936

(dollar figures in millions)

	ALL CORPORATIONS*		MINING		MANUFACTURING		CONSTRUCTION		TRANSP. & OTHER PUBLIC UTILITIES		TRADE		SERVICE	
	Net income	Deficit	Net income	Deficit	Net income	Deficit	Net income	Deficit	Net income	Deficit	Net income	Deficit	Net income	Deficit
<i>1929</i>														
Stat. net income for universe	10,821.8	1,659.8	487.2	183.9	5,644.0	696.6	193.6	67.7	2,920.7	157.4	1,209.1	408.2	367.3	146.0
Est. excess of book profit														
over stat. net income	451.3	763.7	54.9	24.4	361.9	382.0	-7.9	-2.9	-259.3	79.6	293.0	156.9	8.8	123.6
Analysis Z ratio (%)	4.2	46.0	11.3	13.3	6.4	54.8	-4.1	-4.2	-8.9	50.6	24.2	38.4	2.4	84.7
<i>1930</i>														
Stat. net income for universe	6,567.3	2,829.6	229.6	210.2	3,153.6	1,409.6	176.5	78.9	2,026.9	255.0	702.4	707.7	278.4	168.3
Est. excess of book profit														
over stat. net income	591.2	915.5	31.1	102.4	224.3	431.5	10.2	0.4	230.2	129.1	67.6	260.0	27.8	-7.8
Analysis Z ratio (%)	9.0	32.4	13.6	48.7	7.1	30.6	5.8	0.5	11.4	50.6	9.6	36.7	10.0	-4.6
<i>1931</i>														
Stat. net income for universe	3,711.8	3,728.9	79.8	281.8	1,623.4	1,872.7	83.9	87.6	1,313.2	354.9	478.8	932.2	132.6	199.7
Est. excess of book profit														
over stat. net income	296.9	195.0	3.0	67.8	188.5	288.9	-105.2	-17.6	181.9	120.5	21.5	-232.2	7.2	-32.6
Analysis Z ratio (%)	8.0	5.2	3.7	24.1	11.6	15.4	-125.4	-20.0	13.8	34.0	4.5	-24.9	5.4	-16.3
<i>1932</i>														
Stat. net income for universe	2,193.6	4,558.6	71.8	257.7	862.3	2,222.5	32.5	116.3	906.1	564.9	252.5	957.9	68.3	439.3
Est. excess of book profit														
over stat. net income	489.0	427.5	28.8	28.7	203.3	289.5	-6.1	13.6	281.6	95.0	-11.9	79.1	-6.7	-78.4
Analysis Z ratio (%)	22.3	9.4	40.1	11.1	23.6	13.0	-18.7	11.7	31.1	16.8	-4.7	8.3	-9.8	-17.8

<i>1933</i>	Stat. net income for universe	3,028.3	2,670.0	76.0	224.6	1,566.5	1,039.6	24.0	74.8	833.4	584.0	464.4	428.1	64.0	318.9
	Est. excess of book profit	748.8	-16.8	29.4	46.3	342.2	256.8	0.3	10.5	394.3	79.4	19.3	1.4	-6.7	-411.2
	over stat. net income	24.7	-0.6	38.7	20.6	21.8	24.7	1.2	14.0	43.7	13.6	4.2	0.3	-10.4	-129.0
	Analysis Z ratio (%)														
<i>1934</i>	Stat. net income for universe	4,192.8	1,885.9	174.1	106.9	2,037.5	676.8	34.2	57.2	1,121.1	490.3	713.0	298.2	112.9	256.5
	Est. excess of book profit	123.6	72.5	10.4	33.0	51.2	121.4	10.0	6.1	107.5	46.4	2.0	-134.1	-57.4	-0.4
	over stat. net income	3.0	3.8	6.0	30.9	2.5	17.9	29.1	10.7	9.6	9.5	0.3	-45.0	-50.8	-0.2
	Analysis Z ratio (%)														
<i>1935</i>	Stat. net income for universe	5,151.7	1,569.7	184.3	114.1	2,849.8	443.4	51.9	46.4	1,112.3	473.8	818.6	260.5	134.8	231.4
	Est. excess of book profit	111.2	338.7	-14.8	40.5	-75.6	72.9	8.8	3.8	146.1	125.2	68.4	187.4	-21.8	-91.1
	over stat. net income	2.2	21.6	-8.0	35.5	-2.6	16.4	17.0	8.2	13.1	26.4	8.4	71.9	-16.2	-39.4
	Analysis Z ratio (%)														
<i>1936</i>	Stat. net income for universe	6,780.4	1,195.5	278.2	112.8	3,803.6	310.6	71.0	34.2	1,308.1	338.1	1,096.3	188.0	223.3	211.8
	Est. excess of book profit	688.4	503.2	94.3	100.6	302.7	101.8	4.1	8.7	171.1	129.0	10.4	107.6	105.8	55.4
	over stat. net income	10.2	42.1	33.9	89.2	8.0	32.8	5.7	25.4	13.1	38.2	1.0	57.3	47.4	26.2
	Analysis Z ratio (%)														

\* See Table 3, note.

TABLE 20

Estimates of Analysis Z Ratios for Corporate Universe Covered by Sample III Weighted by Method A, by Asset Classes and Net Income and Deficit Categories, 1936  
(dollar figures in millions)

	TOTAL	ASSET CLASSES					CLASSE GROUPE
		Under \$1.0	\$1.0- 5.0	\$5.0- 10.0	\$10.0- 50.0	\$50.0 & over	
ALL CORPORATIONS							
<i>All corporations</i> †							
Stat. net income for universe	7,975.9	1,872.1	1,312.4	594.7	1,359.8	2,695.4	141.5
Est. excess of book profit over stat. net income	1,040.3	219.7	101.6	125.9	242.1	311.0	40.1
Analysis Z ratio (%)	13.0	11.7	7.7	21.2	17.8	11.5	28.3
<i>Mining</i>							
Stat. net income for universe	391.0	109.1	72.9	34.2	81.8	93.2	
Est. excess of book profit over stat. net income	147.1	40.6	21.0	5.1	44.4	36.0	
Analysis Z ratio (%)	37.6	37.2	28.9	14.9	54.3	38.6	
<i>Manufacturing</i>							
Stat. net income for universe	4,114.2	769.0	753.0	362.5	757.1	1,373.1	99.4
Est. excess of book profit over stat. net income	363.1	45.7	40.3	40.2	34.1	190.7	12.1
Analysis Z ratio (%)	8.8	6.0	5.4	11.1	4.5	13.9	12.2
<i>Construction</i>							
Stat. net income for universe	105.1	68.4	24.1	6.0	4.3		2.4
Est. excess of book profit over stat. net income	14.9	10.1	2.9	1.2	-0.4		1.2
Analysis Z ratio (%)	14.2	14.8	12.1	19.6	-9.7		48.9
<i>Transportation &amp; other pub. ut.</i>							
Stat. net income for universe	1,646.2	134.0	116.6	76.9	313.1	1,005.6	
Est. excess of book profit over stat. net income	378.3	48.4	12.6	87.7	147.3	82.4	
Analysis Z ratio (%)	23.0	36.1	10.8	114.0	47.0	8.2	
<i>Trade</i>							
Stat. net income for universe	1,284.3	573.5	224.7	87.6	182.5	216.0	
Est. excess of book profit over stat. net income	42.6	34.2	3.3	-7.2	17.7	-5.4	
Analysis Z ratio (%)	3.3	6.0	1.5	-8.2	9.7	-2.5	
<i>Service</i>							
Stat. net income for universe	435.1	218.1	121.2	27.6	20.9	7.6	39.7
Est. excess of book profit over stat. net income	94.2	40.7	21.4	-1.0	-1.0	7.3	26.8
Analysis Z ratio (%)	21.7	18.7	17.6	-3.6	-4.6	96.3	67.6

	NET INCOME CORPORATIONS						
<i>All corporations †</i>							
stat. net income for universe	6,780.4	1,313.4	1,114.5	530.0	1,228.7	2,470.2	123.6
st. excess of book profit over stat. net income	686.3	65.7	97.8	110.3	170.9	212.9	28.7
analysis Z ratio (%)	10.1	5.0	8.8	20.8	13.9	8.6	23.2
<i>Mining</i>							
stat. net income for universe	278.2	57.1	48.9	27.8	65.3	79.1	
st. excess of book profit over stat. net income	79.6	14.3	15.8	-0.4	30.9	19.0	
analysis Z ratio (%)	28.6	25.0	32.3	-1.3	47.4	24.0	
<i>Manufacturing</i>							
stat. net income for universe	3,803.6	592.9	690.5	343.8	732.3	1,360.2	83.9
st. excess of book profit over stat. net income	312.2	25.2	50.2	37.2	25.0	172.6	1.9
analysis Z ratio (%)	8.2	4.2	7.3	10.8	3.4	12.7	2.2
<i>Construction</i>							
stat. net income for universe	71.0	42.4	18.9	5.4	4.3		
st. excess of book profit over stat. net income	7.0	2.6	3.5	1.3	-0.4		
analysis Z ratio (%)	9.9	6.1	18.8	24.1	-9.7		
<i>Transportation &amp; other pub. ut.</i>							
stat. net income for universe	1,308.1	89.4	85.8	62.1	255.8	815.0	
st. excess of book profit over stat. net income	229.0	6.2	9.5	80.1	106.4	26.8	
analysis Z ratio (%)	17.5	7.0	11.1	128.8	41.6	3.3	
<i>Retail trade</i>							
stat. net income for universe	1,096.3	418.8	208.6	81.9	171.0	216.0	
st. excess of book profit over stat. net income	16.4	15.1	5.2	-7.4	8.9	-5.4	
analysis Z ratio (%)	1.5	3.6	2.5	-9.0	5.2	-2.5	
<i>Service</i>							
stat. net income for universe	223.3	112.9	61.7	8.9			39.7
st. excess of book profit over stat. net income	42.0	2.3	13.5	-0.5			26.8
analysis Z ratio (%)	18.8	2.0	21.9	-5.8			67.6

TABLE 20 (concl.)

	TOTAL	Under \$1.0	\$1.0- 5.0	\$5.0- 10.0	\$10.0- 50.0	\$50.0 & over	CLASS GROUP
<b>DEFICIT CORPORATIONS</b>							
<i>All corporations †</i>							
Stat. net income for universe	1,195.5	558.6	197.9	64.7	131.1	225.2	17.
Est. excess of book profit over stat. net income	354.0	154.0	3.8	15.5	71.2	98.1	11.
Analysis Z ratio (%)	29.6	27.6	1.9	24.0	54.3	43.6	63.
<i>Mining</i>							
Stat. net income for universe	112.8	51.9	23.9	6.4	16.5	14.1	
Est. excess of book profit over stat. net income	67.5	26.3	5.2	5.5	13.5	17.0	
Analysis Z ratio (%)	59.8	50.6	21.8	85.6	81.6	120.8	
<i>Manufacturing</i>							
Stat. net income for universe	310.6	176.2	62.5	18.7	24.8	12.9	15.
Est. excess of book profit over stat. net income	50.9	20.5	-9.9	2.9	9.0	18.1	10.
Analysis Z ratio (%)	16.4	11.6	-15.9	15.7	36.4	140.3	66.
<i>Construction</i>							
Stat. net income for universe	34.2	26.0	5.2	0.6			2.
Est. excess of book profit over stat. net income	7.9	7.5	-0.6	-0.1			1.
Analysis Z ratio (%)	23.2	28.9	-12.3	-23.6			48.
<i>Transportation &amp; other pub. ut.</i>							
Stat. net income for universe	338.1	44.6	30.8	14.8	57.3	190.6	
Est. excess of book profit over stat. net income	149.3	42.1	3.1	7.6	40.8	55.6	
Analysis Z ratio (%)	44.2	94.4	10.2	51.5	71.2	29.2	
<i>Trade</i>							
Stat. net income for universe	188.0	154.7	16.1	5.7	11.5		
Est. excess of book profit over stat. net income	26.2	19.1	-1.9	0.1	8.8		
Analysis Z ratio (%)	13.9	12.3	-11.6	2.6	77.0		
<i>Service</i>							
Stat. net income for universe	211.8	105.2	59.5	18.6	20.9	7.6	
Est. excess of book profit over stat. net income	52.2	38.5	7.9	-0.5	-1.0	7.3	
Analysis Z ratio (%)	24.6	36.6	13.2	-2.6	-4.6	96.3	

\* See Table 6, note.

† See Table 3, note.

the deficit companies, which typically have much larger Analysis Z ratios than the income companies, are given greater weight by Method B than by C. In principle, Method B is superior to C, since C does not differentiate between income and deficit companies even though significant differences are known to exist between the Analysis Z ratios for income and deficit companies.

So much for the problems arising from the weighting procedures. The results themselves are about what would have been expected from an examination of the unweighted sample data. The Analysis Z ratio for the universe covered by the sample ranges from 3.2 to 16.0 percent during the 8 years—to cite the extreme results of the three weighting techniques. For all manufacturing companies, the range is somewhat wider: the lowest ratio is  $-0.1$  for 1935, and the highest is 23.0 for 1933, both weighted by Method B. The range for smaller industrial groups, particularly for construction and service and for some manufacturing groups in isolated years, is much wider. A large share of the extreme instances, however, can be attributed to statistical quirks. If allowance is made for them, the weighted results clearly substantiate the preliminary conclusions from the unweighted sample data. Great reliance should not be placed on the weighted results for any particular industrial group or perhaps even for any single year. But in the aggregate the pattern is sufficiently consistent to give what appears to be a reliable over-all impression of the basic relationship.

#### B FINDINGS OF SAMPLE II ANALYSIS

Although an analysis of the book profit-statutory net income relationship found in the Sample II data (Tables 21 and 22) cannot be expected to yield results as conclusive as those of Sample III, it is worth while for at least two reasons: first, Sample II includes 1937, whereas Sample III ends with 1936; secondly, Sample II, selected on an entirely independent basis, is a check on the reliability of Sample III results, and vice versa.

TABLE 21

Analysis Z Ratios for Differences between Book Profit and Statutory Net Income, Sample II and III Corporations, 1934-1937 (percentages)

	1 9 3 4		1 9 3 5		1 9 3 6		1937 SAMPLE II
	S A M P L E II	S A M P L E III	S A M P L E II	S A M P L E III	S A M P L E II	S A M P L E III	
Mining	31.6	15.5	31.0	8.6	61.7	49.9	44.9
Manufacturing	8.9	6.4	-1.0	-0.1	5.0	9.8	1.3
Foods, bev., & tob.	4.5		-2.8		0.3		-3.5
Metals	14.7		-2.1		4.9		3.5
Miscellaneous	9.9		5.4		11.5		1.2
Trade	32.4	-13.1	13.2	23.7	25.2	9.2	8.8
Public utilities	9.8	25.5	47.4	45.6	53.3	43.8	25.4
Misc. companies	15.8		-6.5		14.9		-2.9

Except for the public utilities group the Sample III ratios are taken from Table 17, weighted by Method B. In the public utilities group the transportation and communication companies were eliminated from Sample III since none is included in Sample II. The Sample III ratios for this group are weighted aggregates of Sample III data computed according to the procedures used throughout this study. No attempt was made to adjust this group ratio for the uneven representation in the sample of various industrial subgroups. Likewise, the Sample II ratios are weighted aggregates of Sample II data for their respective industrial groups.

As a general statement, with the possible exception of the mining group, the Sample II findings when carefully examined appear to be consistent with the Sample III findings. The deviations between the two samples are not larger than would be expected in view of their different size and composition. The general pattern of the Sample II ratios resembles those for most years of Sample III (Table 21).<sup>4</sup> In the mining and public

<sup>4</sup> This comparison was decided upon after Sample II and III data had been separately processed. Because of the different industrial groupings used for the two samples, Sample II and III ratios can be compared for only a few industrial groups. The data for Sample II were not classified into a larger number of groups because the sample was so small that the results for narrower industrial groups would probably have been quite unreliable. The Sample III data could have been reprocessed to present industrial groups more nearly comparable with those of Sample II, but it would have been time consuming and the comparisons would still have been crude unless elaborate care were taken in weighting the combined group ratios for both Samples II and III. The only adjustment made in the Sample III data for purposes of this comparison was to remove the transportation and communication companies from the transportation and other public utilities group. The reader interested in making more detailed comparisons than those in Table 21 can do so by examining Tables 2, 5, 6, and 12. The text summarizes the most important conclusions.



TABLE 22

Book Profit and Statutory Net Income, Sample II Corporations,  
1934-1937  
(dollar figures in millions)

	M A N U F A C T U R I N G							
	MINING	Total	Food, & bev. & tob.	Metals	Misc.	TRADE	PUB. UT.	MISC. CO.
<i>1934</i>								
No. of corp.	28	211	44	103	64	39	38	36
Book profit	20.8	103.8	47.3	37.2	19.3	14.4	104.4	21.9
Stat. net inc.	15.8	95.3	45.3	32.4	17.5	10.9	95.1	18.9
<i>1935</i>								
No. of corp.	32	290	60	137	93	53	51	46
Book profit	21.0	165.4	57.4	75.8	32.2	24.0	125.3	19.6
Stat. net inc.	16.1	167.1	59.1	77.5	30.6	21.2	85.0	21.0
<i>1936</i>								
No. of corp.	50	360	75	173	112	63	58	56
Book profit	27.1	273.2	74.9	136.4	62.0	47.9	154.4	36.2
Stat. net inc.	16.7	260.3	74.6	130.1	55.6	38.3	100.7	31.5
<i>1937</i>								
No. of corp.	48	378	72	188	118	66	63	61
Book profit	38.3	284.6	63.1	153.2	68.2	41.6	172.7	43.2
Stat. net inc.	26.5	280.8	65.4	148.0	67.4	38.3	137.7	44.4

utility groups book profit exceeds statutory net income, on the average and for the majority of individual companies (as is shown below), by a substantial margin. Moderately large positive ratios are shown also for the trade group, but they are primarily attributable to a few extreme cases. In all three manufacturing groups and in the miscellaneous group, book profit and statutory net income are, on the average, much more nearly equal. A slight tendency toward positive ratios appears even in these groups as a whole, but it is scarcely pronounced enough to be regarded as a definite indication that book profit systematically exceeds statutory net income. Even when the average ratios approach zero, however, a considerable dispersion of individual cases is revealed by the frequency distributions (Chart 4). Chart 4 and Table 23 employ the Analysis X instead of the Analysis Z ratio; the reasons for this procedure and the significance of the two ratios are explained in Chapter 11. The data in these charts and tables apply to

**CHART 4**  
**Frequency Distribution of Analysis X Ratios**  
**for Book Profit and Statutory Net Income**  
**Sample II Corporations, 1937**

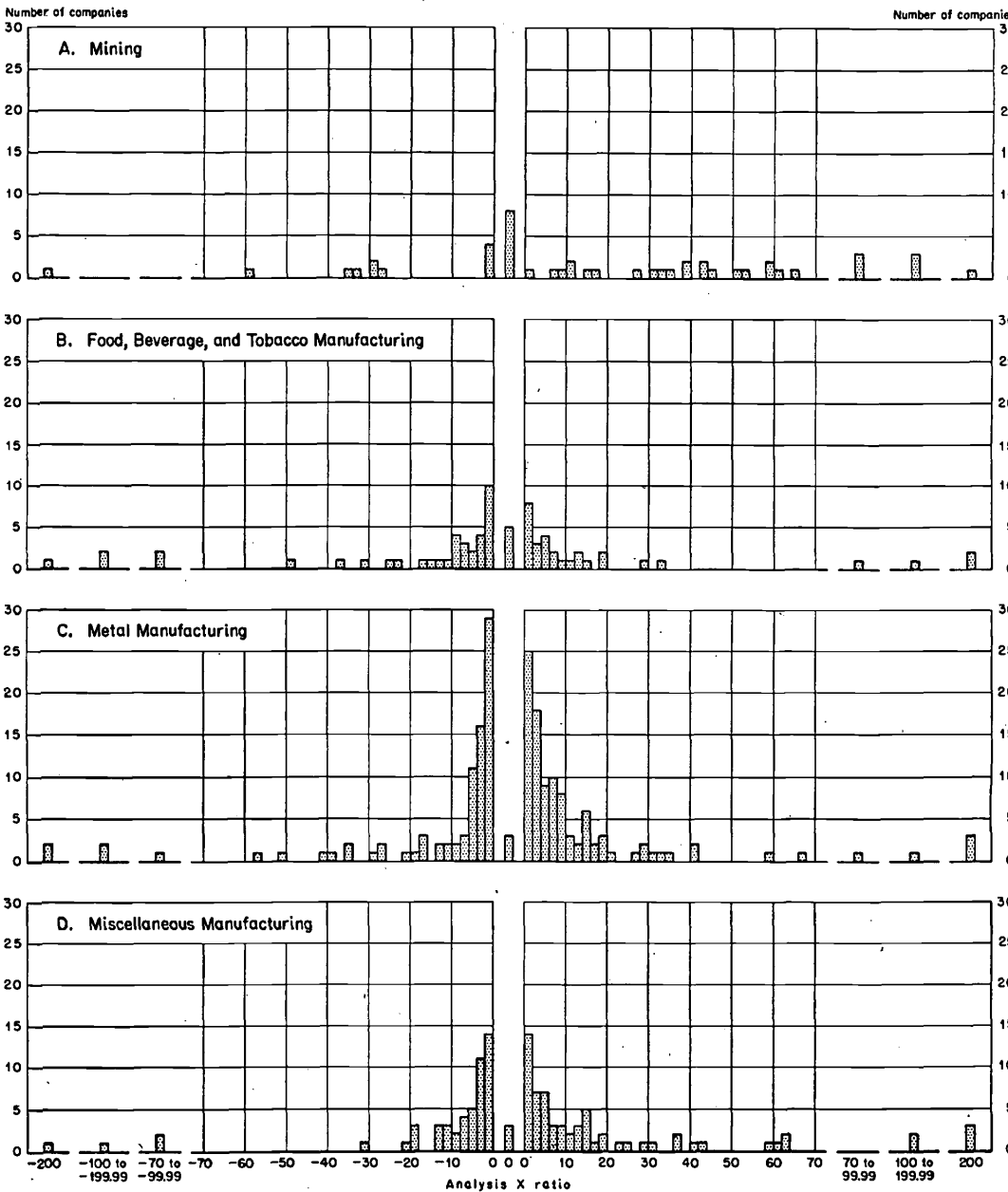


CHART 4 (concl.)

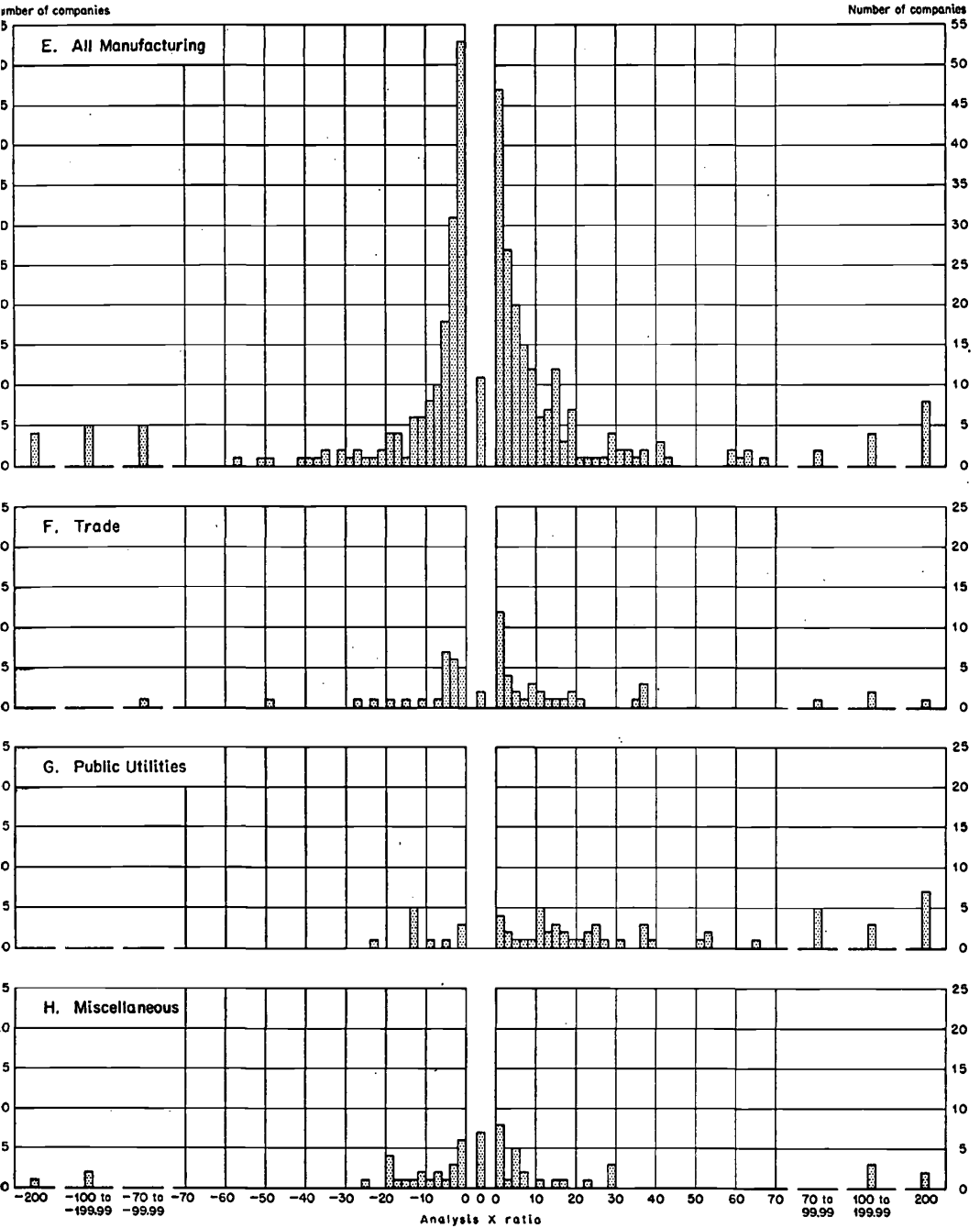


TABLE 23  
Distribution of Analysis X Ratios for Book Profit and Statutory  
Net Income, Sample II Corporations, 1937

	ANALYSIS X RATIO (PERCENTAGES)								
	-100 & under	-50 to	-20 to	Below zero to	Zero	Above zero to	20 to	50 to	100 & over
	-99.99	-49.99	-19.99			19.99	49.99	99.99	
	SIMPLE PERCENTAGE DISTRIBUTION								
Mining	2.1	2.1	10.4	8.3	16.6	14.6	18.8	18.8	8.3
Manufacturing	2.4	1.8	4.0	37.3	2.9	41.3	5.0	2.1	3.2
Foods, bev. & tob.	4.2	2.8	6.9	37.5	6.9	33.3	2.8	1.4	4.2
Metals	2.1	1.6	4.3	36.7	1.6	45.2	4.8	1.6	2.1
Misc.	1.7	1.7	1.7	38.1	2.6	39.8	6.8	3.4	4.2
Trade	0.0	1.5	4.6	33.3	3.0	43.9	7.6	1.5	4.6
Public utilities	0.0	0.0	1.6	15.6	0.0	34.4	18.7	14.1	15.6
Misc. companies	4.9	0.0	1.6	36.1	11.5	31.1	6.6	0.0	8.2
	CUMULATIVE PERCENTAGE DISTRIBUTION								
Mining	2.1	4.2	14.6	22.9	39.5	54.1	72.9	91.7	100.0
Manufacturing	2.4	4.2	8.2	45.5	48.4	89.7	94.7	96.8	100.0
Foods, bev. & tob.	4.2	7.0	13.9	51.4	58.3	91.6	94.4	95.8	100.0
Metals	2.1	3.7	8.0	44.7	46.3	91.5	96.3	97.9	100.0
Misc.	1.7	3.4	5.1	43.2	45.8	85.6	92.4	95.8	100.0
Trade	0.0	1.5	6.1	39.4	42.4	86.3	93.9	95.4	100.0
Public utilities	0.0	0.0	1.6	17.2	17.2	51.6	70.3	84.4	100.0
Misc. companies	4.9	4.9	6.5	42.6	54.1	85.2	91.8	91.8	100.0

1937 but broadly they are characteristic of the other years as well.

The mining group has substantially higher ratios in Sample II than in Sample III in each year, 1934-36 (Table 21). From one point of view this is not especially surprising, since the 1934 and 1935 ratios for Sample III are considerably smaller than those shown for the mining group in Sample III in most other years, 1929-36. It may well be that the relatively small ratios for the mining corporations in Sample III are in part attributable to peculiarities in the sample for 1934 and 1935; the marked divergence between the Sample II and III ratios is consistent with this hypothesis, although it by no means demonstrates its validity. On the other hand, an examination of the industrial division of the two samples makes the relatively low ratios of Sample III harder to explain. Oil and gas producing companies are poorly represented in Sample II.

Since they typically have very high Analysis Z ratios, the expectation would be that Sample III ratios would exceed, not fall short of, Sample II ratios. As the mining corporations of Sample II have a marked concentration of larger positive ratios (Chart 4 and Table 23) statistical quirks are apparently not responsible for the high group ratios.

This evidence casts serious doubts on the representativeness of the mining and quarrying groups of Sample III for 1934 and 1935, although it does not prove that they are unrepresentative. The higher ratios for the mining group in most other years, however, provide some reason for believing that deficiencies, if any, in the Sample III data are in large part confined to these two years.

The ratios for manufacturing corporations in the two samples correspond closely. In 1934-36 they differ by only 2.5, 0.9, and 4.8 percent, respectively. These results are as close as could be expected when account is taken of the differences in the size and composition of the samples. Moreover, the subgroups of Sample II follow the same general pattern as those of Sample III, coming within or near the zero to +10 percent range and tending to have low positive ratios. Likewise, the basic frequency distributions for the manufacturing corporations of Sample II have the same general configuration as those of Sample III.

The ranges in the trade group are much wider, but they can be largely explained on two grounds. First, the frequency distributions of the trade group in Sample II seem inconsistent with the rather large ratios of this group. The 1934 ratio is especially high; in other years the ratios appear slightly higher than their frequency distributions warrant. The explanation for the high ratios is found in the fact that in each year three or four large companies reported much higher book profits than statutory net incomes. If these companies were eliminated, the sample would show a small positive ratio in each year for the trade group. Secondly, the 1934 and 1935 ratios for Sample III would be moved 10 percentage points nearer the

Sample II ratios if the Method C rather than the Method B weighting procedure were employed; moreover, the deviations between the Sample III ratios resulting from the two weighting methods are caused almost exclusively by very high ratios in the deficit category of a single subgroup in each year. In these particular instances the Method C weighting procedure may yield more reliable results.<sup>5</sup> After proper account is taken of these two abnormalities, the Sample II and III data for the trade group as a whole appear to be reasonably consistent.

In the public utility group the correspondence between the ratios for the two samples is reasonably close except in 1934. In 1935 the two ratios are almost identical. In 1936 both ratios exceed 40 percent; consequently, the difference between them, 10 percentage points, is not unduly large. The difference in 1934 is much larger, but, as the note to Table 26 indicates, there is strong evidence that the Sample II ratio is substantially too low in this year because of an error in reporting.

The remaining industrial groups are insufficiently represented in Sample II to warrant detailed comparisons with Sample III.

<sup>5</sup> It should be noted that the discrepancy in 1936 would be somewhat increased by the use of the Method C ratio, 3.5 percent, instead of the Method B ratio, 9.2 percent. In 1936, in contrast to 1934 and 1935, however, the ratio for the deficit corporations for each of the three industrial subgroups systematically exceeds the ratios for the income category by substantial amounts, thereby supporting the reliability of the Method B ratio.