Volume Title: Corporate Income Retention, 1915-43

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Volume Publisher: NBER

Volume ISBN: 0-870-14138-4

Volume URL: http://www.nber.org/books/dobr51-1

Publication Date: 1951

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Chapter URL: http://www.nber.org/chapters/c4832

Chapter pages in book: (p. 13 - 26)

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INCOME RETENTION AT VARIOUS NET INCOME LEVELS: ALL MANUFACTURING CORPORATIONS, 1922–43

THE amount of income earned by a corporation and the amount of this which will be retained cannot, of course, be entirely unrelated. If net income is low, retained income must also be low, even though dividend payments are suspended. It is possible to retain large amounts only when net income is substantial, though corporations may or may not wish to avail themselves of this opportunity. The question arises, therefore, whether there is a definite pattern of relationship between corporate net income and retained income.

During the expansion years of the twenties the notion was rather widespread that sound financial policy required retention in the enterprise of 50 cents out of every dollar of net income. In the late thirties some large corporations considered the retention of 30 percent of net income an appropriate long-run policy.[1] Statistical data analyzed in this and the two following chapters indicate a fairly clear pattern of relationship between corporate net income and retained income; but our analysis shows that the proportion of income retained by corporations does not remain constant but varies with the level of corporate income.

In this chapter aggregate data relating to all manufacturing corporations for the period 1922–43 are considered. Chapter 4 contains an analysis of data relating to samples of large- and of small- and medium-sized companies for comparable periods. An attempt is made to answer specifically the following questions:

1. How much did corporations retain at various levels of corporate net income?

[1] The federal government began to apply the "30 percent" principle in 1939, in connection with the penalty tax on "excessive" corporate income retention (Section 102 of the Internal Revenue Code). See Chapter 5 for comments on this aspect of federal tax policy.

2. How were changes in net income from one year to the next reflected in retentions and in dividends?
3. Was there a trend in corporate retentions over the period studied, that is, did corporations retain more or less out of a given net income toward the end of the period than in the beginning of it?
4. To what extent were corporate income retentions influenced by factors other than profitability?

The time series analysis in these two chapters is supplemented by a cross-section analysis in Chapter 5, where data for various individual companies in given years, and periods of several years, are considered.

In all subsequent discussions the term *net income* will be used to designate income after interest charges and all corporate taxes. Negative net income will be referred to as *net deficit; retained income* will be used to denote the part of net income remaining after payment of preferred and common stock dividends. Thus defined, retained income is equivalent to *net* corporate saving. Negative retained income, which may result from the payment of dividends in excess of net income, or from a net deficit, will be referred to as *net dissaving*.

NET INCOME, DIVIDENDS, AND RETAINED INCOME: 1922–43

Chart 1 presents dollar amounts of net income, dividends, and retained income for several groups of manufacturing corporations.[2] The data in Panel A are for all manufacturing corporations, and it can be seen that all three series show distinct cyclical fluctuations but no pronounced trend over the twenty-two-year period (1922–43). In the case of net income cyclical movements are very wide and there is an almost complete conformity with the turning points of the reference cycles established by the National Bureau of Economic Research.[3] The dividend series is far from stable, but the range of its cyclical swings is much narrower than that shown by the net income series. While dividends declined substantially during the depressions of the early thirties and of 1938, there was little response to the relatively minor cyclical contractions of 1924 and 1927. In the early thirties the dividend series showed a one-year lag at the beginning of both the slump (1930) and the recovery (1933). On the

[2] Sources of data for all charts are given in Appendix A.

[3] See Arthur F. Burns and Wesley C. Mitchell, *Measuring Business Cycles* (National Bureau of Economic Research, 1946) p. 78.

other hand, in the severe contraction of 1938 and the revival of 1939 net income and dividends moved "in step." [4]

The retained income series shows much more cyclical variation than the dividend series. Negative amounts (net dissaving) are in evidence for a considerable portion of the period. The retained income series is divisible into five distinct periods: 1922–29, 1930–35, 1936–37, 1938, and 1939–43.

Table 1—PROPORTION OF NET INCOME RETAINED BY MANUFACTURING CORPORATIONS IN SELECTED YEARS [a]

Year	*All Manufacturing*	*Large Manufacturing*		*Small Manufacturing* [b]
	Percentage of Reported Net Income Retained	Percentage of Reported Net Income Retained	Percentage of Adjusted Net Income Retained	Percentage of Adjusted Net Income Retained
1922	40.5%	30.1%	25.7%	—281.8%[c]
1923	41.3	44.4	46.3	54.5
1925	37.6	44.9	49.3	48.5
1929	30.4	43.4	48.3	23.5
1936	5.3	21.8	25.8	1.2
1937	3.8	25.3	30.3	—17.4 [c]
1940	36.2	29.3	33.1	49.8
1941	48.4	33.5	41.5	64.1
1942	53.9	32.3	43.4	57.3
1943	56.7	29.4	42.3	62.3

[a] All manufacturing, U. S. Treasury Department, *Statistics of Income, 1922–43;* large manufacturing, National Bureau of Economic Research sample of 45 large companies; small manufacturing, National Bureau of Economic Research sample of 73 Wisconsin companies.

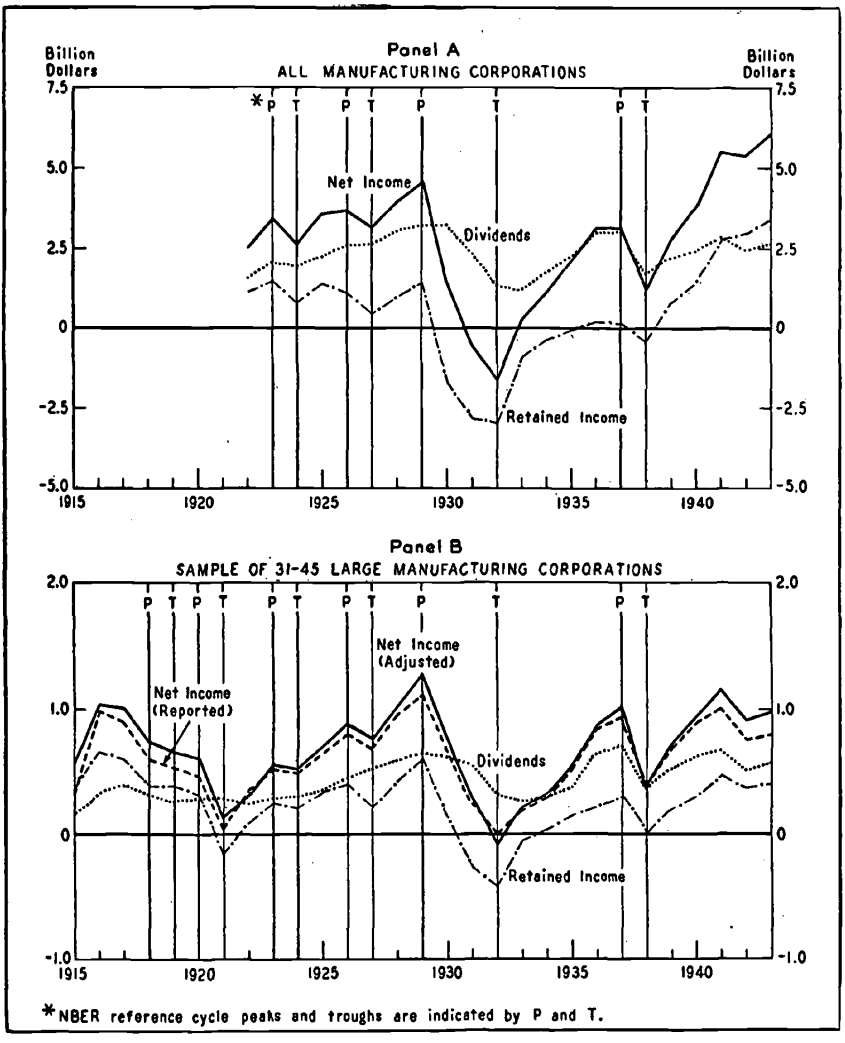
[b] The difference between reported and adjusted net income of these companies is small and percentages of reported net income have been omitted.

[c] Net dissaving in percent of net income.

(1) In the 1922–29 period yearly retentions were substantial, including years of cyclical contraction. Changes in net income from one year to

[4] It should be noted that, since our data are available on an annual basis only, they do not reflect time lags shorter than one year. If data were available on a quarterly basis, changes in dividends would undoubtedly lag behind those in net income, even for the shorter cycles. For example, the *Journal of Commerce* series on dividend payments by corporations (seasonally adjusted by the National Bureau of Economic Research) reaches a peak in the second quarter of 1937 and a trough in the fourth quarter of 1938. Judging from Harold Barger's series on net corporate profits (*Outlay and Income in the United States, 1921–38,* National Bureau of Economic Research, 1942, p. 299) the peak in corporate profits was reached in the fourth quarter of 1936 and the trough in the second quarter of 1938. Dividends lagged net income by two quarters in each instance.

Chart 1—NET INCOME, DIVIDENDS, AND RETAINED INCOME OF ALL MANUFACTURING CORPORATIONS



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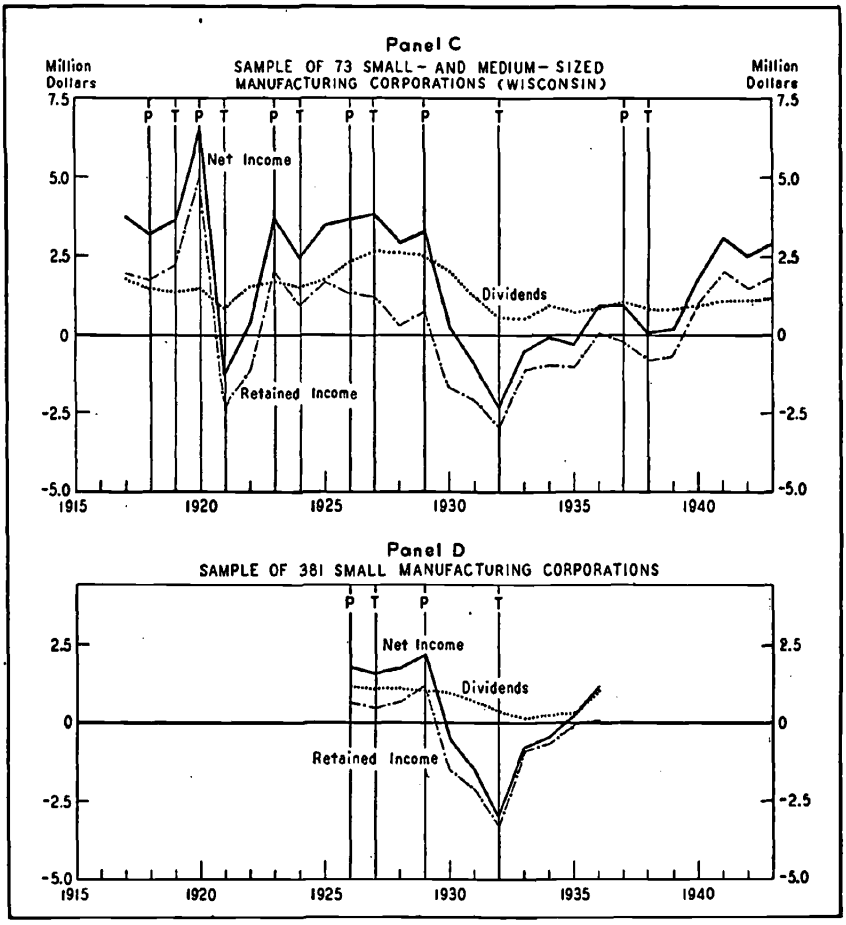
the next were in most cases accompanied by more than proportionate changes in the same direction in retained income. On the other hand, a substantial increase in net income over the entire eight-year span was accompanied by a much less-than-proportionate increase in retained income. As a result, and as is indicated in Table 1, the proportion of net

Chart 1—(concluded)



Fluctuations in the net income and retained income of manufacturing corporations are wide and usually conform with changes in general business conditions. Dividends vary less and show some tendency to lag at turning points.

income retained (the ratio of retained income to net income) was considerably lower at the end than at the beginning of the period.[5]

[5] Comparing two cyclical peak years—1923 and 1929—it is found that, in 1923, $1,413 million was retained out of net income of $3,419 million (that is, 41 percent); in 1929, $1,378 million was retained out of net income of $4,537 million (that is, 30 percent). Despite an increase in net income of $1,118 million, retained income registered an absolute decline of $35 million.

(2) The period 1930–35 was characterized by substantial net dissaving. It is significant that the amount dissaved by all manufacturing corporations during those years ($8,935 million) exceeded by more than half a billion dollars the amount they retained during the entire period 1922–29.

(3) In 1936 and 1937, net income was again relatively high, but retentions were unusually small, amounting to less than 5 percent of net income. The undistributed profits tax, imposed by the Revenue Act of 1936, must have been largely responsible for this circumstance.[6]

(4) Net dissaving appeared again in 1938, and the amount dissaved in that year ($435 million) was substantially greater than that retained during the preceding two years ($282 million).

(5) In the period 1939–43 net income was relatively high and retentions were resumed on a substantial scale for the first time since the twenties. In 1939 the dollar amounts of net income and retained income were close to those registered in 1924; in both instances roughly one-quarter of net income was retained. The rapid increase in net income in 1940–43, however, was accompanied by a pronounced rise in the proportion retained, which in 1943 reached 56.7 percent—the highest level for the entire period 1922–43.

CORRELATION OF NET INCOME AND RETAINED INCOME

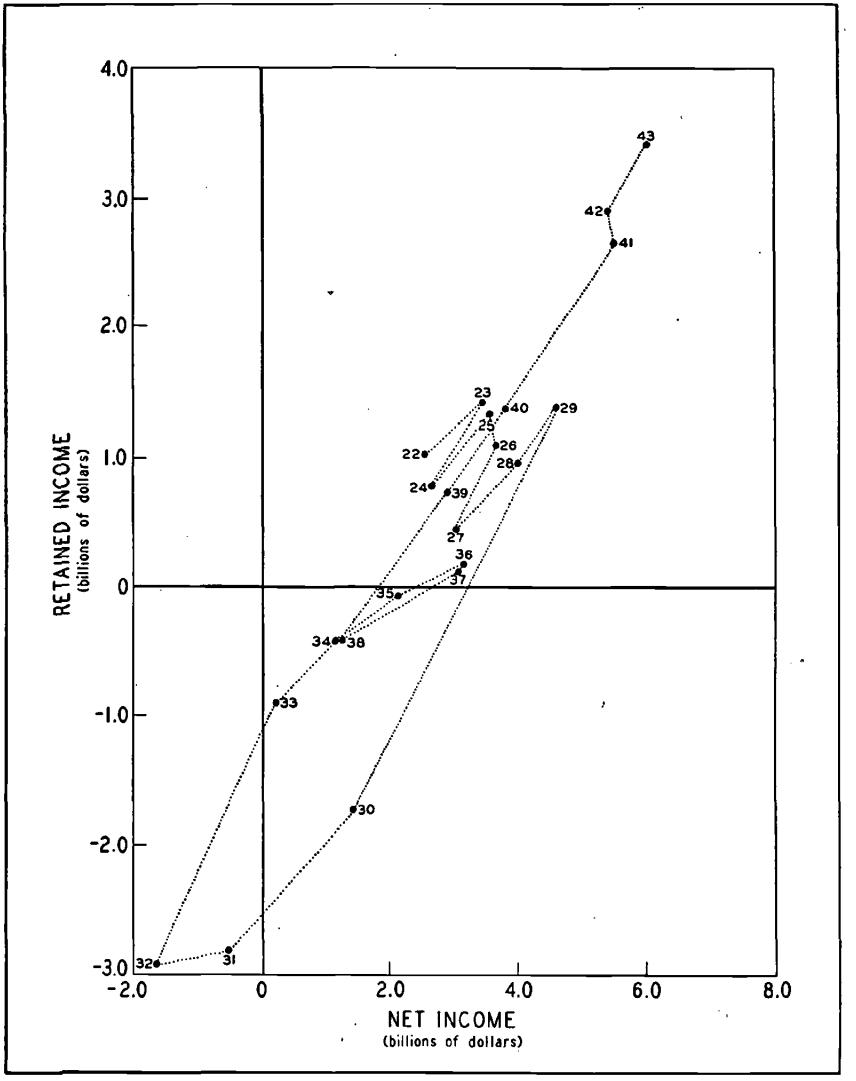
Chart 1 shows that net income and retained income usually moved in the same direction, yet there is evidence of considerable year-to-year variation in the *amount* of change in retained income associated with a given change in net income. The extent of this variation can be seen in Chart 2, in which retained income and net income for each year from 1922 to 1943 are related in a scatter diagram.[7]

There were several distinct changes during the period 1922–43 in the relation between the amount of income retained and the amount of net income earned. Thus, in the period 1932–43 there would be a fairly clear pattern if the years 1936 and 1937, when the undistributed profits tax was in effect, were disregarded. The years 1928–31 reveal a somewhat different pattern: a given amount of net income was associated with

[6] See Chapter 5 for a discussion of the effect of this tax on retentions.

[7] Although current net income seems to be the most important factor determining retained income, other factors also influence income retentions. For the moment, however, we shall set these other considerations aside, and see what can be learned about corporate saving from its relation to current income alone.

Chart 2—THE RELATION BETWEEN AMOUNTS OF NET INCOME AND RETAINED INCOME, ALL MANUFACTURING CORPORATIONS, 1922–43



Dollar amounts of corporate savings bear a direct relationship to the amount of corporate net income, but the amounts saved at given income levels vary widely.

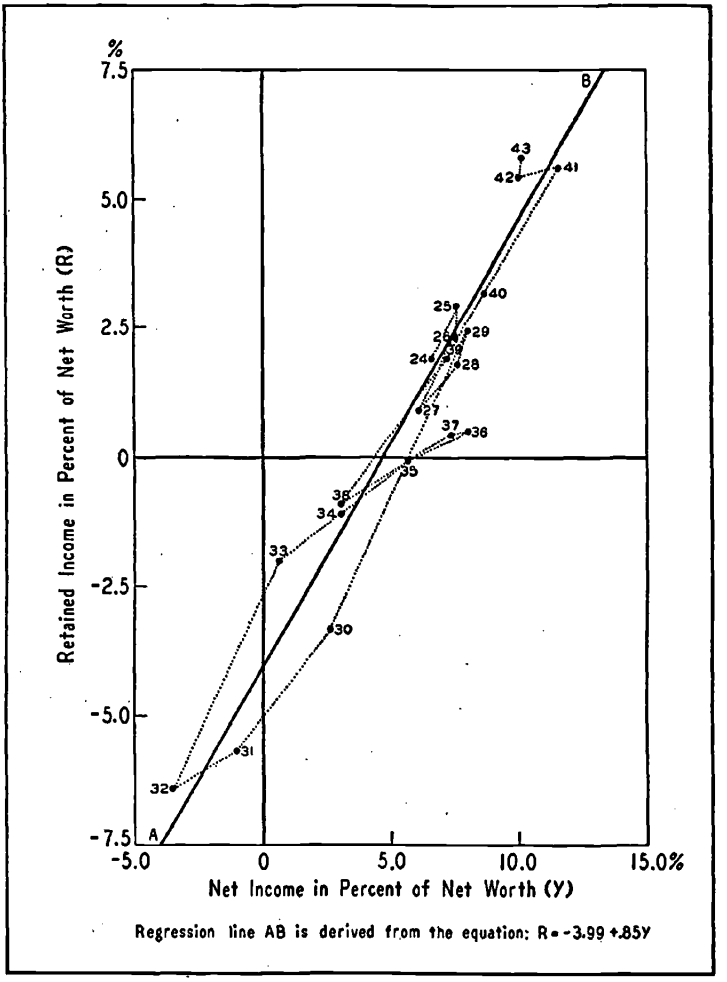
smaller corporate savings than in 1932–43. In the period 1922–29 there are zigzag, or accordion-like, movements reflecting a tendency for corporations to retain less out of a given amount of net income in the successive years of that decade. Despite these variations, however, Chart 2 reveals a general tendency for retained income to respond much more strongly than dividends to changes in net income. A change in retained income amounted, in most cases, to much more than one-half of the change in net income, which means, of course, that the change in dividends was relatively small.

In the short run, fluctuations in the dollar amounts of net income correspond fairly well to fluctuations in the rate of return on capital invested. In the long run, however, there need not be any close relation between the two. Since investors are primarily concerned with the rate of return on their capital, it is clear that a company's ability to retain income depends in the main on its net income considered in relation to the owners' capital. Accordingly, in analyzing the relationship between net inome, retained income, and dividends, it is more appropriate to have all variables expressed per unit of capital rather than in absolute dollar amounts. Chart 3 presents a correlation between net income and retained income, both expressed as percentages of net worth.[8] It can be seen that the relationship can be fairly well described by a straight line fitted for the entire period.[9] The regression equation, obtained by the method of least squares, and the coefficient of correlation for these data are given in Table 2 (Equation 1). This analysis shows that corporations began to save when the rate of net income approached the level of 5 percent, while below that level net income was associated with net dissaving. A change in the rate of net income

[8] It must be admitted that the ratio of net income to net worth, computed on the basis of book values, is not an accurate measure of the rate of return on investors' capital. Yet changes in this ratio more closely approximate variations in the actual rate of return than do changes in dollar amounts of net income. Furthermore, the use of this ratio has the advantage of making it possible to compare the data for all manufacturing corporations with the data for our samples of large and small corporations. It may be objected that by dividing net income, savings, and dividends by net worth a certain degree of spurious correlation is introduced. We would contend, however, that income retention decisions depend largely on the rate of return on capital rather than on the absolute amount of profit, and that therefore the rates are the variables to be correlated. It is the correlations between absolute amounts that are, in this sense, spurious or misleading. Cf. G. V. Yule, "On the Interpretation of Correlations Between Indices or Rates," *Journal of the Royal Statistical Society,* Vol. 73, pp. 644-47.

[9] The line was fitted for the period 1924–43, omitting the years 1936 and 1937 in which the undistributed profits tax had a depressing effect on corporate income retentions (see Chapter 5 for a discussion of the effect of this tax). The years 1922 and 1923 could not be included owing to lack of data on net worth.

Chart 3—THE RELATION BETWEEN RATES OF NET INCOME AND RETAINED INCOME, ALL MANUFACTURING CORPORATIONS, 1924–43



The relation between the rate of net income and the rate of retained income over the period 1924–43 can be fairly well described by a straight line.

of 1.0 percentage point (*e.g.*, from 10 to 11 percent of net worth) was accompanied, on the average, by a change in the same direction in the rate of retained income of about 0.8 percentage point (*e.g.*, from 4.5 to 5.3 percent of net worth), and a change in the dividend rate of about 0.2 percentage point (*e.g.*, from 5.5 to 5.7 percent of net worth).

Table 2—SUMMARY OF CORRELATION RESULTS FOR ALL MANUFACTURING COMPANIES AND FOR SAMPLES OF LARGE AND SMALL COMPANIES

Equation Number		*Regression Equation* [a]	*Coefficient of Correlation*
1	All manufacturing companies, 1924–43 [b]	$R = -3.99 + .85Y$	.97
2	Sample of 31–45 large companies, 1915–43 [b]	$R = -3.49 + .80Y$	.98
3	Sample of 73 small- and medium-sized Wisconsin companies, 1917–43	$R = -3.34 + .81Y$	.98
4	Sample of 381 small companies, 1926–36 [c]	$R = -2.89 + .75Y$	.95

[a] R = rate of retained income; Y = rate of net income. These equations can easily be converted into the equations showing the relation between dividends (D) and net income (that is, $D = 3.99 + .15Y$ for all manufacturing companies). Such derived equations for dividends are the same as those which could be obtained from a regression of dividends on income, but the coefficients of correlation in the latter case would be different from those shown above.

[b] The years 1936 and 1937—when the undistributed profits tax was in effect—are excluded.

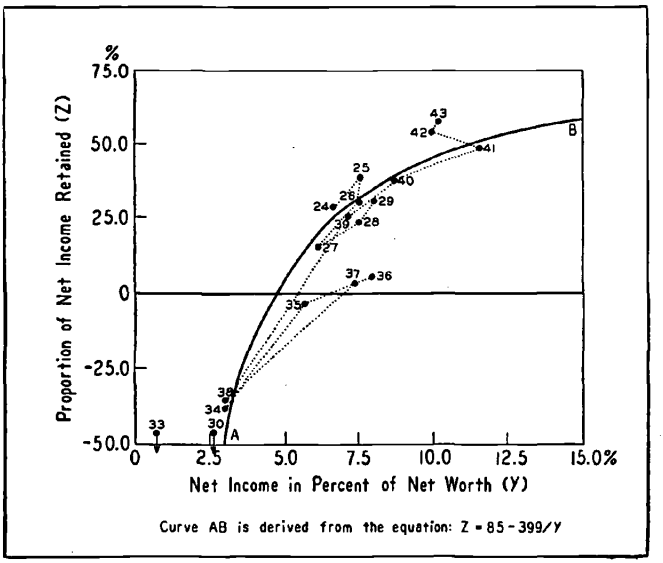
[c] The year 1932 is excluded because of the extreme values of R and Y in that year, relative to the other years.

It should be noted further that while a given change in the rate of net income was associated with the same change in the rate of retained income at different income levels, the proportion of net income retained varied with the level of net income.[10] For instance, at a net income rate of 6 percent, approximately one-sixth of net income was retained; at a net income rate of 12 percent, the part retained was about one-half of

[10] The functional relationship between corporate net income and corporate retained income may be termed the corporate propensity to retain, and one may distinguish between the average and the marginal propensities, as is customary in dealing with individuals' propensity to save. Our simple linear regression equation implies that the *marginal* propensity to retain remained constant while the *average* propensity to retain increased with the rate of profit.

the total. The relation between the rate of net income and the proportion retained, as revealed by Chart 4, indicates the tendency for the proportion of corporate net income retained to grow as net income increases, though at a declining rate.[11]

Chart 4—THE RELATION BETWEEN THE RATE OF NET INCOME AND THE PROPORTION OF NET INCOME RETAINED, ALL MANUFACTURING CORPORATIONS, 1924–43
(*Deficit Years Omitted*)



The proportion of net income saved by manufacturing corporations increases with net income, but at a declining rate.

Finally, it must be pointed out that the data reveal no trend—in either upward or downward direction—in the "propensity to retain" of all manufacturing corporations over the period 1924–43. True, wider deviations from the general pattern, as represented by the regression line in Chart 3,

[11] The curve drawn in this chart was derived from Equation 1 in Table 2. Let Z be the proportion retained. Then $Z = R/Y$. Since $R = -3.99 + .85Y$, it follows that $Z = .85 - 3.99/Y$. In the chart the values of Z have been multiplied by 100, in order to express them in percentage form.

are observable in some parts of this period than in others; but there is no evidence of a persistent long-run tendency for income retention at given net income levels to increase or decrease.[12]

SHORT-RUN TENDENCIES WITHIN THE PERIOD 1924–43

A detailed description of short-run deviations from the general pattern of relationship between net income and retained income for 1924–43 would go beyond the scope of this study. A few brief comments, however, on the expansion of the twenties and the contraction and recovery of the thirties will be pertinent.

The zigzag movements of the twenties, already referred to, can be observed also in Chart 3, although they are less pronounced than in Chart 2. Minor declines in the rate of net income in 1926 and 1927 were accompanied by pronounced drops in the rate of retained income. In 1928 and 1929 the rate of net income recovered considerably and reached a level higher than that of 1925, while the rate of retained income showed relatively small improvement, remaining well below the 1925 level.

These changes must be partly accounted for by a succession of good years in the twenties which brought about an increase in dividend requirements toward the end of that decade. Stock market prices were rising much more rapidly than net income,[13] and the distribution of a greater proportion of net income among the stockholders tended to offset to some extent a sharp increase in the price-dividend ratio.[14] The payment of larger dividends was probably facilitated by a relative decrease toward the end of the boom in the need for a continued accumulation of funds

[12] When time is introduced as a separate variable in the regression equation, the following results are obtained for the period 1924–43 (omitting 1936 and 1937 in this case to permit evaluation of the time factor independently of the temporary disturbance created by the undistributed profits tax):

$$R = -4.34 + .84Y + .04t$$
$$\pm .05 \quad \pm .04$$

As can be seen, a positive regression coefficient is obtained for t, but its standard error is too high for it to be considered statistically significant.

[13] See Alfred Cowles, 3rd, and associates, *Common Stock Indexes* (Bloomington, Indiana, 1939) p. 405.

[14] A large part of stock purchases in the late twenties was made for capital gain. Investors of this kind were not greatly concerned with fluctuations in the dividend rate. Even so, when the entire body of stockholders is considered, there is little doubt that pronounced increases in market prices tend to raise aggregate dividend requirements.

by corporations: opportunities for further business expansion became less numerous and less inviting for many concerns; at the same time, the surpluses and reserves already built up weakened the "precautionary" motive for further retentions.

Turning to the period marked by net dissaving (1930–34), there is considerable difference between the contraction and recovery phases. Lines connecting the years 1932–34 are on a much higher level than those connecting 1930–32, reflecting the relative stickiness of dividends at the start of both slump and recovery. Despite a sharp decline in net income, dividends in 1930 remained at virtually the 1929 level. In 1931 and 1932 dividends were reduced sharply, but the total paid in these two years exceeded the amount paid in 1933 and 1934, even though 1931 and 1932 were characterized by net deficits, and in the other two years net income was reported. This can be explained by the fact that many corporations, having made large payments out of surplus in 1931 and 1932, were not able to pay unearned dividends in the following two years. Even companies whose income had recovered materially by 1934 were cautious in their dividend policies.

Finally, it is interesting to note that after the undistributed profits tax had ceased to affect income retention, the relation between rates of net income and retained income was not essentially different from what it had been during the twenties (1924–29) and the middle thirties (1934–35).[15]

SUMMARY OF CONCLUSIONS

1. Year-to-year variations in the aggregate net income and retained income of all manufacturing corporations show a definite relationship to each other. During the period studied (1922–43), a change of 1.0 percentage point in the rate of net income was associated, on the average, with a change in the same direction of approximately 0.8 percentage point in the rate of retained income. This relationship held at various levels of net income, including the deficit range.

2. Rates of net income above 5 percent (approximately) were associated, on the average, with income retention, and rates of net income below that level with net dissaving.

[15] While this is true of the aggregate data, many individual companies pursued dividend policies in the late thirties that differed notably from their policies in the twenties or early thirties. See Chapter 5 for a discussion of intercompany differences.

3. The proportion of net income retained increased as net income increased, though at a decreasing rate.

4. While corporations retained more out of a given net income in some periods than in others, differences, in general, were not large and there is no evidence of a definite trend in the corporate propensity to retain over the entire period 1922–43.