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## INCOME RETENTION AT VARIOUS NET INCOME LEVELS: LARGE- AND SMALL- AND MEDIUM-SIZED MANUFACTURING CORPORATIONS

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SAMPLE data have been used in our analysis of large- and of small- and medium-sized corporations. Though the samples are rather small, their use has allowed for a longer time period coverage. Furthermore, fuller information was available for the companies included in the samples than would have been the case had aggregate data been used, and this facilitated the analysis of retention policies.

In comparing the sample data with those for all corporations it should be borne in mind that the size distinction is not the only factor making for differences in behavior. In particular, since the samples are comprised of identical corporations, they are perforce limited to established firms. The aggregate data, on the other hand, include newly organized as well as older firms, and the two groups may well differ from one another in their retention policies.

### LARGE MANUFACTURING CORPORATIONS

#### *Net Income, Dividends, and Retained Income: 1915-43*

The data analyzed in this section are for two samples of large manufacturing corporations: one sample includes 31 companies and takes in the period 1915-22, and the other comprises 45 companies and covers 1922-43.<sup>1</sup> The aggregate dollar amounts of net income, dividends, and retained income of these companies are presented in Panel B of Chart 1. Two net income series are given: one showing net income as reported in financial statements of the companies; the other giving net income adjusted to (1) eliminate the amounts representing revaluations of assets and certain other noncash items, and (2) include the amounts allocated to capital reserves out of current earnings.<sup>2</sup> Panel B indicates that in most

<sup>1</sup> For a more detailed description of these samples see Appendix A.

<sup>2</sup> For a fuller description of these adjustments and of the technique used in making them, see Albert R. Koch, *The Financing of Large Corporations, 1920-39* (National Bureau of Economic Research, Financial Research Program, 1943) Appendix B.

years the difference between the two series of net income is relatively small and that the direction of year-to-year movements in both series is the same.

A comparison of data for large companies and for all manufacturing companies (Chart 1) reveals a good deal of similarity in behavior but also some noteworthy differences. As in the case of all corporations combined, the net income of large companies showed pronounced cyclical fluctuations conforming very well to the reference business cycles. Likewise, the two net income series are similar in the sense that they show no clear upward or downward trend. Large companies, however, showed a much more pronounced increase in net income during the twenties (1922–29), a less severe drop in net income in 1930–32, and a greater degree of recovery (relative to the 1929 peak) in the period 1933–37 than did all corporations combined. Another difference is that the upswing of net income in the years 1939–43 was considerably smaller (relative to the preceding cyclical peaks) for large companies than for all corporations combined.

Dividends of large companies showed a definite upward trend in the first half (1915–29) of the period studied, but there was no distinct movement in the second half (1929–43). The dividend series responded only slightly to the cyclical contractions in 1919, 1921, 1924, and 1927. In contrast, there was a pronounced decline during the cyclical contractions of 1930–32 and 1938. Dividends of large corporations did not lag at the cyclical turning point of 1929, and the downward movement was very mild in 1930 and 1931, despite a sharp contraction of net income. Dividends fell substantially in 1932 and showed a further drop in 1933, thus lagging one year behind the reference cycle turning point.

The retained income series for large corporations indicates sharp cyclical fluctuations, but considerably shorter and less pronounced periods of dissaving than the series for all corporations. A slight downward trend is discernible over the entire period 1915–43, but not during the interwar years 1919–41. Comparing the retained income series for all companies combined, and for large corporations by periods, the following observations can be made:

(a) During the period 1922–29, large corporations retained substantially greater proportions of net income than all corporations combined. The figures giving the proportion retained in various years are in Table 1. It should be noted that the data on large corporations, contrasted with the

data on all corporations, indicate no appreciable downward drift in the proportion of net income retained during this period.<sup>3</sup>

(b) Large corporations sustained a much shorter period of net dissaving during the severe depression of the early thirties than did corporations in the aggregate. They registered a net deficit in only one year (1932) and net dissaving in only three years (1931-33). Net dissaving during these three years was \$716.8 million; while retained income during 1922-29 amounted to \$2,219.2 million.<sup>4</sup> Thus, while the dissaving of all manufacturing companies during the depression was in excess of the total amount retained in the preceding eight-year period of prosperity, the net dissaving of large companies in this same period amounted approximately to only one-third of their total retentions in the preceding prosperity years.

(c) In 1936-37 the performance of large corporations again differed considerably from that of corporations in the aggregate. Large corporations retained a considerable proportion of their net income compared with the very minor retentions of all corporations combined. Owing primarily to the undistributed profits tax, the proportion of net income retained by large corporations in 1936-37 was well below the proportion retained in the twenties, but the tax did not result in the distribution of all, or even almost all, of it.

(d) While the retained income of large corporations dropped to virtually nothing during the contraction year, 1938, it remained positive, compared with the net dissaving registered at that time by all corporations combined.

(e) Increases in net income and retained income of large corporations during the period 1939-43 were much less pronounced than those for all corporations combined. The proportion of net income retained by large companies in 1939-43 remained substantially below that retained in the twenties, though the opposite was true of corporations in the aggregate.

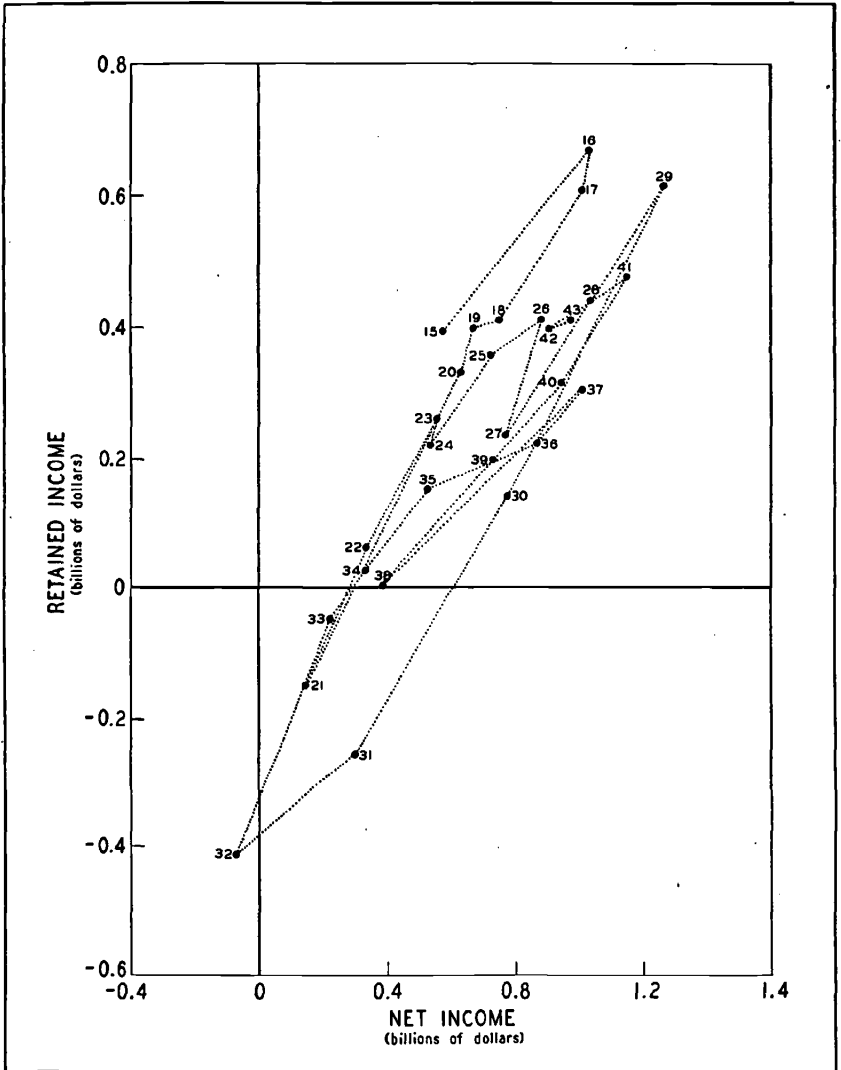
#### *Correlation of Net Income and Retained Income*

The relation between dollar amounts of net income and retained income of large corporations is given in Chart 5, and the relation between rates of

<sup>3</sup> Comparing again the peak year of the early twenties with the peak year of the late twenties, we find that, in 1923, \$239.6 million were retained out of reported net income of \$539.7 million (or 44.4 percent) while, in 1929, \$502.2 million were retained out of reported net income of \$1,156.6 million (or 43.4 percent).

<sup>4</sup> These amounts have been computed on the basis of reported net income. By using "adjusted" net income instead, the amounts of \$714.8 and \$2,623.8 million, respectively, are obtained.

Chart 5—THE RELATION BETWEEN AMOUNTS OF NET INCOME AND RETAINED INCOME, SAMPLE OF LARGE MANUFACTURING CORPORATIONS, 1915-43



As in the case of manufacturing corporations of all sizes, the amounts of retained income and net income of large companies bear a direct relation to each other, but the amounts saved at given income levels vary widely.

net income and retained income (both variables taken per unit of net worth) of these companies is shown in Chart 6.<sup>5</sup> As in the case of all manufacturing corporations, it can be seen that when retentions are related to the rate of profit, a fairly stable general pattern is obtained for the entire period studied. Chart 6 reveals that large corporations, on the average, incurred net dissaving when the rate of net income was below 4.5 percent of net worth. Net income rates above that mark were accompanied by corporate saving, a change of 1.0 percentage point in the rate of net income being associated, on the average, with a change in the same direction of 0.8 percentage point in the rate of retained income. These findings are very similar to those presented in Chapter 3 for all manufacturing corporations combined.

The relation between the rate of net income and the proportion of net income retained is shown in Chart 7,<sup>6</sup> where it is clear that the proportion of income retained tended to increase with net income, though at a decreasing rate. In the highest net income range (represented by the years 1915-18) the proportion of net income retained increased hardly at all with increases in net income.

The data for large corporations indicate a slight downward trend in the "propensity to retain" over the period 1915-43: there was a tendency to retain less at a given level of net income in the later, as compared with the earlier, years.<sup>7</sup>

#### *Short-Run Tendencies Within the Period 1915-43*

The data for large corporations, like those for all companies combined, show shorter-run tendencies diverging from the general pattern of relationship between net income and retained income established for the entire period 1915-43. To some extent these divergences are associated

<sup>5</sup> Adjusted net income data are used in all correlations for large corporations. The regression equation and the coefficient of correlation, computed from the data shown in Chart 6, are given in Table 2.

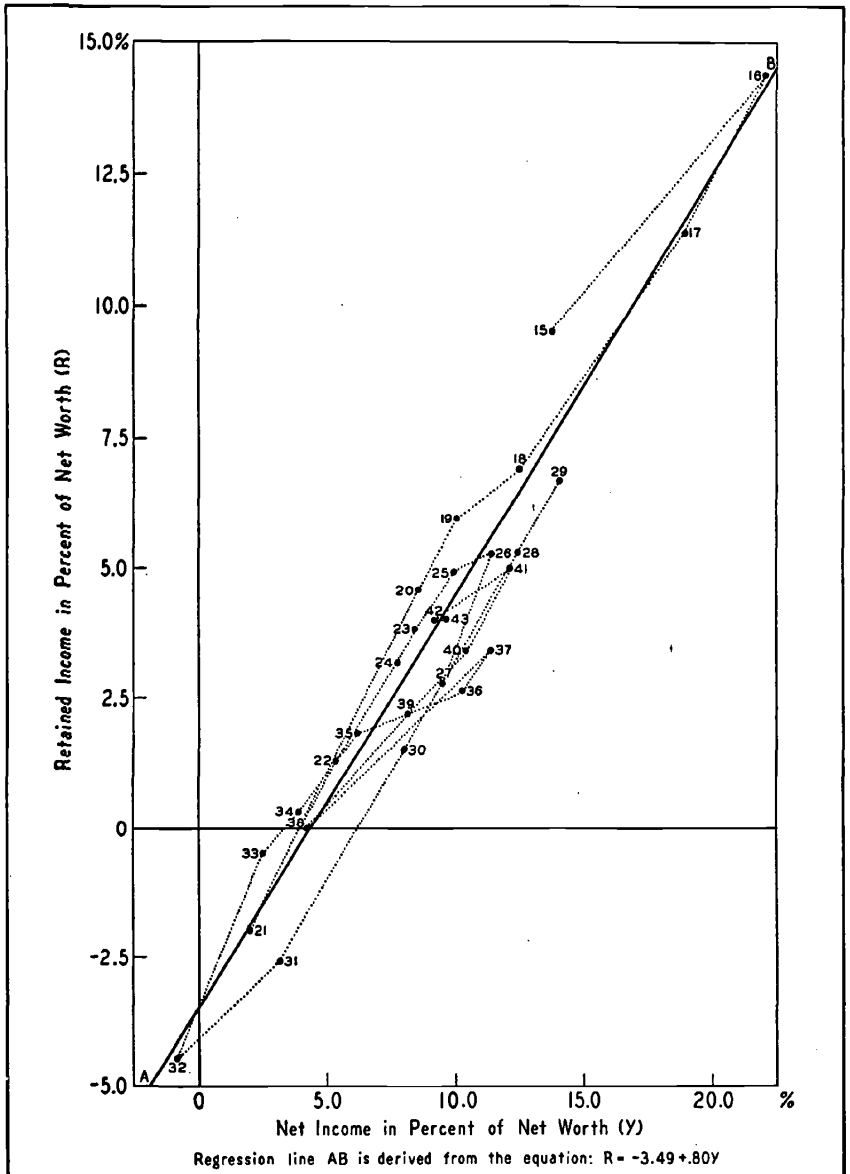
<sup>6</sup> As in the case of all corporations, the curve fitted to these data has been derived from the results of the correlation between rate of net income and the rate of retained income. (Equation 2 in Table 2.)

<sup>7</sup> The introduction of time as a separate variable in the regression equation gives the following results:

$$R = -2.14 + .75Y - .07t \\ \pm .04 \quad \pm .02$$

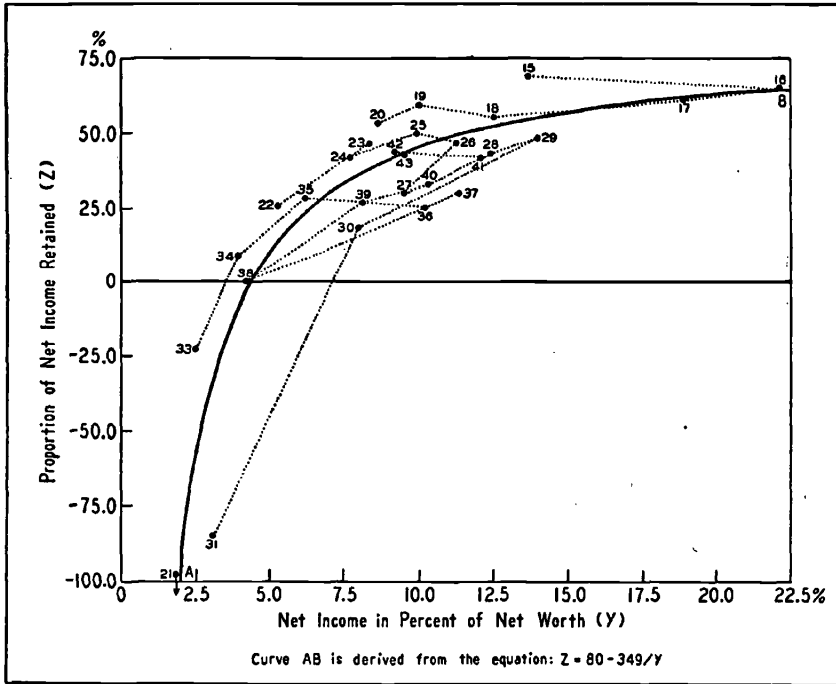
The period covered is 1915-43, the years 1936 and 1937 being omitted in this case also, for reasons already explained (see footnote 12 on page 24). It can be seen that while the trend revealed by correlation analysis is not very pronounced, it must nevertheless be considered statistically significant.

**Chart 6—THE RELATION BETWEEN RATES OF NET INCOME AND RETAINED INCOME, SAMPLE OF LARGE MANUFACTURING CORPORATIONS, 1915-43**



Rates of net income and retained income of large manufacturing corporations show a clear pattern of relationship. In general, saving was performed at an income rate above 4.5 percent and dissaving at lower rates.

Chart 7—THE RELATION BETWEEN THE RATE OF NET INCOME AND THE PROPORTION OF NET INCOME RETAINED, SAMPLE OF LARGE MANUFACTURING CORPORATIONS, 1915-43  
(Deficit Years Omitted)



The proportion of net income saved by large manufacturing corporations increases rapidly from 0 to 45 percent, as net income rises from 4.5 to 10 percent of net worth. At higher income rates the proportion saved increases more slowly.

with the lagging response of dividends to changes in net income, a matter that will be explored more fully in the next section.

While the rates of net income and retained income fluctuated widely during the years 1915-20, their relation to each other during that period did not deviate materially from the general pattern, except in 1915 (Charts 6 and 7). The rate of net income rose very sharply in that year because of the wartime boom, but the pressure for higher dividends was,



as usual, somewhat slow in asserting itself. As a result, an unusually high proportion of net income (69 percent) was retained. In 1916, the proportion retained dropped to 65 percent, despite a further substantial increase in the rate of net income. This is understandable, because in the second consecutive year of high earnings dividend pressure becomes much stronger, and, accordingly, companies make larger distributions.<sup>8</sup>

During the twenties, as can be seen in Charts 6 and 7, there was a tendency for large corporations to retain less out of a given level of income toward the end of the period than at the beginning. In this respect the behavior of large corporations was similar, although less pronounced than that of all manufacturing concerns.

Again, during the depression period 1930–35, there was a difference between the contraction years (1930–32) and the recovery years (1933–35) similar to that indicated by the data on all corporations—namely, a tendency for dissaving at a given level of net income to be more pronounced in the early contraction years than in the recovery phase.

When income retention was resumed in the middle thirties, the relation between the rates of net income and retained income was fairly close to what it had been in the early twenties. In 1936 and 1937, however, the tax on undistributed profits changed the general pattern. After the sharp cyclical contraction of 1938, when retentions were negligible, the relation between net income and retained income followed closely the pattern of the late twenties. In 1942 and 1943, however, retentions exceeded the level that would have been indicated by that pattern. In those two years, net income decreased from the 1941 level, and dividends were adjusted downward with unusual promptness. The lack of dividend stickiness in this case may have been motivated by a sense of wartime precaution that made corporations reluctant to slow up the rate of surplus accumulations; it may also have been influenced by the stiff rates of wartime personal income taxes.

#### *Relative Importance of Profitability and Some Other Factors Affecting Income Retention*

In the analysis of data for large manufacturing corporations, an attempt has been made to measure statistically the influence of some factors other than net income which may be expected to exert a systematic effect upon

<sup>8</sup> The rate of net income rose from 13.7 percent of net worth in 1915 to 22.1 percent in 1916, while the dividend rate advanced from 4.3 percent of net worth to 7.8 percent.

income retentions.<sup>9</sup> In this connection the following three factors have been taken into account.

### 1. *Reserve Requirements*

In the evaluation of a company's reserve position, the management usually considers earned surplus as a general reserve for contingencies, over and above reserves set aside for specific purposes. Moreover, earned surplus serves as a special reserve which enables the company to make dividend distributions in profitless years. While a strong reserve position is desirable, the motivation to continue strengthening the company's reserves would be expected to decrease as the combined amount of surplus and reserves increased relative to the total amount of capital invested. There should be a certain optimum relation between surplus and reserves on the one hand and paid-in funds on the other, depending upon the severity of the fluctuations to which the business is subject. If accurate forecasting were possible, the appropriate policy would be to allocate to surplus and reserves amounts sufficient to take care of the deficits and unearned dividends of lean years, but not essentially in excess of such requirements in the long run. Actually, no enterprise can be certain that its reserves are adequate to meet all conceivable future emergencies. Yet it cannot be expected to accumulate surplus and reserves indefinitely, without regard for their relation to total capital invested.

### 2. *Expansion Requirements*

The financing of asset expansion through income retention has advantages over external financing in that negotiations with outside agencies are avoided and no specific commitments need be made regarding the rate of return to be paid on the funds, the length of time they will remain in the

<sup>9</sup> Some writers have been inclined to minimize the importance of any "general" factors in the distribution of corporate net income. For example, Arthur Stone Dewing comments thusly on the question of how corporate net income is apportioned: "This question is, in the end, not one of the theory of accounts or of business law or even of universally applicable financial principles. It is purely one of individual business expediency." *The Financial Policy of Corporations* (New York, 1946) Vol. 2, p. 774. At the end of his discussion, however, Dewing identifies three major factors affecting retentions: "First, is the confidence the directors have in the accounting methods by which the net earnings are computed and particularly in the sufficiency of the reserves set aside for depreciation, obsolescence and contingencies. Secondly, the directors must determine the amount of the net earnings remaining after these allowances which the directors believe it wise to reinvest in the business. Finally, they must weigh the strength of the feeling that a dividend rate once commenced should be adhered to, a policy which necessitates that reserves should be set aside in good years to be used to pay dividends during years of deficient earnings." *Ibid.*, p. 783.

enterprise, or the use to which they will be put.<sup>10</sup> In addition, statements giving detailed information about a company's financial condition are unnecessary when new financing is done through income retention.

A highly profitable company has an advantage both in retaining income and in obtaining external funds, being able to float new issues of securities on attractive terms even though a large portion of its income is not distributed. This is impossible for companies of low profitability. For them, the possibility of internal financing is limited first by the fact that net income is small and could not add much to surplus even if dividends were suspended and, second, by the stockholders' reluctance to have earnings reinvested in a business with poor financial prospects. Should the management persist nonetheless in carrying on an expansion program, it would probably find itself compelled to use internal financing to the fullest possible extent.<sup>11</sup> In a situation of this kind a sharp conflict between the management's policy and the stockholders' preferences can easily develop.

### 3. Dividend Requirements

The management of a growing concern, no matter how strong its preference for internal financing may be, may find itself compelled to distribute a large part of net income if the stockholders' pressure for dividends is sufficiently strong. Since the American stockholder, unlike his European counterpart, cannot vote on dividend payments, the management's position in this matter is relatively strong, but pressure can be exerted by stockholders in certain indirect ways.

First, the stockholders' disapproval of a company's dividend policy may be expressed by voting the directors out of office. True, it is often difficult to organize large numbers of stockholders for concerted action against the management, yet, in the long run, no board can completely disregard the wishes of the owners of a substantial majority of the stock.

Second, a company's past dividend record is important when new stock is floated. In the long run, very few companies are able to increase equity by means of income retention alone. In most cases additional stock is

<sup>10</sup> It is true, of course, that a new issue of common stock does not necessitate making all of these commitments, yet subscribers to new shares normally expect dividend payments more or less in conformity with those made in the immediate past. In contrast, an increase in equity through retention need not lead to a change in the aggregate amount of dividends paid in the immediately succeeding period.

<sup>11</sup> The management may wish to expand and, in evaluating the company's future earning power, it may take a more optimistic view than the stockholders. Furthermore, the management may have other than financial incentives for expansion. See Norman S. Buchanan, "Theory and Practice in Dividend Distribution," *Quarterly Journal of Economics*, Vol. 53 (November 1938).

offered to the public from time to time, and the new investors' preference for a stock with a high and stable dividend record must be taken into account by the management.

Third, if some stockholders (even a minority group) are convinced that retentions have been consistently excessive, they may take legal action to force the company to increase dividend distributions. This has been done successfully in a few cases,<sup>12</sup> although, in the main, the courts seem unwilling to interfere with the directors' policy of retention unless it is obviously extreme and arbitrary.

Stockholders' interest in dividend disbursement depends on their consumption habits and the range of investment opportunities open to them. Consumption habits do not change rapidly, and this accounts largely for stockholders' preference for a stable flow of dividends. Investment preferences and opportunities do vary greatly, but these variations are not necessarily accompanied by rapid shifts of preferences as between reinvestment in the same company and "outside" investment. During a period of business expansion investment opportunities are likely to become more attractive inside the company as well as in the general market; in a period of contraction the attractiveness of both outside investment and reinvestment diminishes. It is unlikely, therefore, that many stockholders have a strong preference for leaving part of the income in the company in one year and withdrawing the entire income and investing part of it outside the company in the following year. On the contrary, it seems reasonable to assume that, on the whole, the interest in dividend disbursement remains fairly stable from year to year. On the other hand, dividend pressure may vary a good deal from one company to another, depending essentially on differences in the number and the financial status of stockholders.

Statistical tests made by Jan Tinbergen in his study of business cycles<sup>13</sup> throw some light on the role of "reserve requirements" and "dividend requirements" as factors affecting the division of corporate income into the retained and distributed parts. In Tinbergen's analysis, dividends ( $D'$ ) are a function of the following three variables (all expressed in dollars): current corporate net income ( $Y'$ ),<sup>14</sup> corporate net income in the preced-

<sup>12</sup> The best known case is *Dodge v. Ford Motor Co.*, 204 Michigan, 459 (1919).

<sup>13</sup> Jan Tinbergen, *Statistical Testing of Business Cycle Theories* (League of Nations, Economic Intelligence Service, Geneva, 1939) Vol. 2, p. 115.

<sup>14</sup> In Tinbergen's notation  $Z$  stands for net income, but  $Y$  has been used above for the sake of conformity with the other equations in this study. To distinguish between dollar amounts and rates of net income, etc., the symbols  $D'$ ,  $Y'$ ,  $Y'_{-1}$  and  $S'_{-1}$  are used when the variables are expressed in dollars.

ing year ( $Y'_{-1}$ ), and corporate surplus at the end of the preceding year ( $S'_{-1}$ ). Using aggregate data for all American corporations, for the period 1919-32, he obtained the following regression equation:

$$D' = 0.151Y' + 0.083Y'_{-1} + 0.075S'_{-1}$$

Since dividends are equal to the difference between current net income and current retained income, this equation can easily be transformed into one relating directly to retained income ( $R'$ ):

$$\begin{aligned} R' &= Y' - 0.151Y' - 0.083Y'_{-1} - 0.075S'_{-1} & (1) \\ &= 0.849Y' - 0.083Y'_{-1} - 0.075S'_{-1} \end{aligned}$$

Equation 1 indicates that retained income varies directly with current net income and inversely with the preceding year's income and surplus. Changes in current income appear to be the main factor responsible for variations in the amount retained.<sup>15</sup> The inverse relationship between retained income and the preceding year's net income is doubtless accounted for by the relative stability of dividend requirements. A substantial increase in net income from one year to the next is not, as a rule, accompanied by a commensurate rise in the stockholders' pressure for dividends. Expansion requirements, on the other hand, are usually adjusted much more quickly, and, as a result, the greater part of the increased income is retained rather than used to increase dividends.<sup>16</sup>

The relation between retentions and surplus may be expected to reflect the influence of either reserve or dividend requirements, or both. When surplus increases relative to paid-in capital, this may be taken to indicate an improvement in the company's reserve position. Therefore, if net income remains constant, such a change in surplus should be associated with a greater proportion of net income being distributed and a smaller proportion retained. On the other hand, when both surplus and paid-in capital are increasing proportionately, there may be no change in the reserve position; but there is a strong presumption that dividend requirements will become greater because of the additional stockholders' invest-

<sup>15</sup> Tinbergen does not give supplementary measures required for an accurate comparison of the regression coefficients of the three independent variables, but the preponderant influence of current income seems obvious.

<sup>16</sup> There is no theoretical reason why only the immediately preceding year's income should be introduced into the equation. In some cases, current retention may be influenced by a company's income record during the past two or three years. In dealing with aggregate data, however, one may assume that the influence of the past is fairly well represented by the immediately preceding year.

ment. It is clear that, as the amount of paid-in equity increases, a greater *total amount* of dividends will have to be paid in order to maintain the same *rate* per share. Therefore, if net income remains constant, this change should also be associated with a greater proportion of income being distributed and a smaller proportion retained. During the greater part of the period analyzed by Tinbergen (1919-32), there was a substantial increase in both paid-in capital and surplus. Consequently, both of the above factors were probably at work.<sup>17</sup>

The three factors selected by Tinbergen have been used in our analysis of retained income of large manufacturing corporations during the period 1923-43,<sup>18</sup> and the following regression equation has been obtained:

$$R' = -23.4 + .72Y' - .07Y'_{-1} - .07S'_{-1} \quad (2)$$

$$\pm .07 \quad \pm .08 \quad \pm .038$$

As can be seen, this equation is only slightly different from Tinbergen's,<sup>19</sup> despite the difference in coverage and time. This indicates a substantial stability of retention policies and similarity of performance between all American corporations in the aggregate and large manufacturing corporations as a separate group.

It is more interesting for our purposes to relate rates of net income and retained income rather than dollar amounts. When all the variables are expressed as percentages of net worth, the data yield the following equation for the period 1916-43:<sup>20</sup>

$$R = -4.51 + .79Y - .02Y_{-1} + .03S_{-1} \quad (3)$$

$$\pm .07 \quad \pm .06 \quad \pm .07$$

In a comparison of this equation with Equation 2 (correlation of dollar amounts) it will be noted that, with respect to the relation between retained income ( $R$ ) and current net income ( $Y$ ), the results are approximately the same. As for the preceding year's income ( $Y_{-1}$ ), the regression coefficient is much smaller in Equation 3, but in both instances the stand-

<sup>17</sup> The relation between retentions and surplus is further discussed on page 40, where the data on large corporations are presented.

<sup>18</sup> The sample of 45 companies has been used for this analysis.

<sup>19</sup> The absence of a constant term in Tinbergen's equation is explained by the fact that he expresses his variables as deviations from the mean.

<sup>20</sup> The samples of 31 and 45 companies have been used for this analysis.  $R$  and  $Y$  are expressed as percentages of the current year's average net worth.  $Y_{-1}$  is expressed as a percentage of the preceding year's average net worth.  $S_{-1}$  is expressed as a percentage of net worth at the end of the preceding year.

ard errors are relatively large, so that it is impossible to draw any definite conclusion as to the effect of this variable on retentions.<sup>21</sup>

An interesting difference between Equations 2 and 3 is found with respect to the relation between current retentions ( $R$ ) and surplus at the end of the preceding year ( $S_{-1}$ ). When dollar amounts are correlated, a negative regression coefficient of  $S'_{-1}$  is obtained, indicating that current retentions tended to be smaller when the previously accumulated surplus was higher. In contrast, when rates are correlated, the regression coefficient of  $S_{-1}$  is found to be positive, but its standard error is so large that it cannot be considered significant. In other words, retentions and surplus do not appear in this case to be significantly related to each other.

These different results can be accounted for as follows: Changes in the dollar amount of surplus may, as mentioned above, mean that the reserve position has been altered, or merely that the total amount of equity capital has changed, depending on how surplus and paid-in capital have moved relative to each other. When the ratio of surplus to net worth is used, however, the size factor (that is, the size of the stockholders' capital) is eliminated, and the variable may be said to represent changes in reserve position with greater accuracy.<sup>22</sup>

According to Equation 3, changes in the reserve position exerted no appreciable influence on the income retentions of large manufacturing corporations. Consequently, the relation between  $R'$  and  $S'_{-1}$ , obtained when dollar amounts are correlated (Equation 2), may be taken to represent mainly the effect of changes in capital size.

The lack of relationship indicated by Equation 3 may be due to the relatively strong reserve position maintained by large concerns throughout the period studied. It may very well have been that the ratio of surplus to net worth invariably remained above the level at which the reserve requirements could have greatly influenced retention policies.

A second test was made using the data on large corporations to learn more about the "dividend requirements" factor and at the same time to obtain information on the significance of the "expansion requirements" factor. Since corporations are, as a rule, reluctant to change their dividend policy abruptly, the preceding period's dividend payments may be taken as a rough measure of the requirements of the current period. As to "expan-

<sup>21</sup> It should be mentioned that the preceding year's income has been found to be significantly correlated with current income, and this intercorrelation of the two factors may account for the unreliability of the regression coefficient of  $Y_{-1}$ .

<sup>22</sup> The effect of the size factor may not be completely eliminated inasmuch as there may be some correlation between the ratio of surplus to net worth and size.

sion requirements," the evaluation of this factor is hampered because no data are available on planned corporate expansion (*ex ante*); the only available figures relate to asset expansion actually carried out in the various years (*ex post*). Yet, it seems that a rough measure of expansion requirements may be obtained if the growth of operating assets (that is, all assets other than cash and marketable securities) is studied.<sup>23</sup>

Accordingly, in the second test retained income ( $R$ ) was considered a function of the following three variables: current net income ( $Y$ ), dividends in the preceding year ( $D_{-1}$ ) and operating asset expansion in the current year ( $E$ ).<sup>24</sup> The following equation was obtained for the period 1916-43:

$$R = -1.42 + .70Y - .35D_{-1} + .11E \quad (4)$$

$$\pm .05 \quad \pm .11 \quad \pm .05$$

For net income, these results are closely similar to those discussed above: A change in the rate of net income by one percentage point was associated with a change in the rate of retained income in the same direction by 0.7 percentage point.

Dividend requirements, as measured by the preceding year's dividends, appear to have had a considerable effect on income retentions. At given levels of net income, retentions were higher or lower depending on whether dividend disbursements were lower or higher in the preceding year. On the average, a difference of one dollar (per \$100 of net worth) in the preceding year's dividends was associated with a difference of 35 cents (per \$100 of net worth) in current retained income.<sup>25</sup>

Expansion requirements also appear to have been a factor of considerable importance. Other things being equal, retentions were greater in the years in which the rate of operating asset expansion was higher.

On the whole, then, our analysis indicates that retained income of large

<sup>23</sup> When a company retains one dollar of income, its total assets are necessarily greater by exactly one dollar, other things remaining equal. If this dollar is held in cash or invested in marketable securities, this may be due to reserve rather than expansion requirements. On the other hand, if the dollar is invested in operating assets, there is more justification for assuming that the expansion motive has been at work.

<sup>24</sup> As in the previous equations, all variables are expressed as rates, rather than dollar amounts. Net income and retained income are in percent of average net worth. Dividends in the preceding year are in percent of the average net worth of the preceding year. Operating asset expansion is in percent of operating assets at the beginning of the year.

<sup>25</sup> With a given net income, an increase (decline) in retained income means, of course, a decline (increase) in dividends by exactly the same amount. The above equation may easily be transformed into an equation where current dividends ( $D$ ) are a function of current income, preceding year's dividends and operating asset expansion:

$$D = 1.42 + .30Y + .35D_{-1} - .11E$$



manufacturing corporations has been dependent, to a large extent, on current profitability, the continuity of dividend policies, and the rate of asset expansion. On the other hand, the effect of "reserve" requirements, as a separate factor, appears to be nominal.

For convenient comparison, the multiple regression equations for all American corporations and for large manufacturing corporations are rewritten below, so as to express retained income ( $R$ ) in all cases as a function of current net income ( $Y$ ) and of the preceding year's dividends ( $D_{-1}$ ).<sup>26</sup>

*All American corporations:*

(all variables are expressed in dollars)

$$R' = .85Y' - .55D'_{-1} + .05Y'_{-2} - .08S'_{-1} + .04S'_{-2}$$

*Large manufacturing corporations:*

(all variables are expressed in dollars)

$$R' = .72Y' - .25D'_{-1} + .02Y'_{-2} - .07S'_{-1} + .02S'_{-2} - 17.55$$

*Large manufacturing corporations:*

(all variables are expressed as rates)

$$R = .70Y - .35D_{-1} + .11E - 1.42$$

#### SMALL- AND MEDIUM-SIZED MANUFACTURING CORPORATIONS

Data on two samples of small- and medium-sized manufacturing corporations will now be considered. One sample consists of 73 Wisconsin manufacturing companies and the other of 381 companies from various states.<sup>27</sup>

Wisconsin manufacturing corporation data are available for 1917-43, almost the same period as that covered by large manufacturing corporation data. Unfortunately, the Wisconsin corporations are not completely representative of the behavior of all manufacturing corporations of comparable size, since these companies appear to have been hit harder by the depression of the early thirties and showed considerably less recovery in the middle and late thirties than small- and medium-sized corporations in

<sup>26</sup> The first two equations have been derived from Equations 1 and 2, respectively, by writing out the expression  $S'$  for two consecutive years and substituting for  $Y'_{-1}$  its equivalent in terms of  $D'_{-1}$ ,  $Y'_{-2}$ , and  $S'_{-2}$ .

<sup>27</sup> For a fuller description of these samples see Appendix A.

general. The sample of 381 companies seems more representative, but data are available for 1926–36 only. In view of these limitations, the discussion of the behavior of small- and medium-sized corporations will be brief.

The aggregate dollar amounts of net income, dividends, and retained income for the Wisconsin sample are presented in Panel C of Chart 1 and the corresponding data for the 381 companies in Panel D.<sup>28</sup> It is obvious that the behavior of the Wisconsin series differs markedly from that of the selected large corporations. The trend of the net income series of the Wisconsin companies is downward over the period 1917–43, its highest peak appearing in 1920. During the 1922–29 period net income of these companies failed to show an upward trend. Actually, net income in 1928 and 1929 was below the level of 1923. During the entire decade of the thirties financial returns were unsatisfactory; in some years a deficit was incurred and in the others only small net income was earned. It was not until the years 1940–43 that net income showed substantial improvement, and even then it remained below the average level of the twenties.

Dividends for Wisconsin companies show no marked trend over the entire period 1917–43, but did increase over the period 1922–29, despite a small decline in net income. The reduction in dividends during the years 1930–32 was relatively much greater than for large corporations, and the pronounced increase in net income in 1940 and 1941 failed to increase dividends much above the low level of the thirties.

Finally, the chart shows income retentions to have been very substantial during the period 1917–20, with more than three-quarters of net income retained in the latter year. The proportion retained in the twenties showed a strong downward tendency.<sup>29</sup> During the severe depression of the early thirties, Wisconsin corporations registered very heavy dissaving, which amounted to \$9.6 million, substantially exceeding the aggregate amount retained in the period 1923–29 (\$8.3 million). Although a small amount was retained by these companies in 1936, it was not until 1940 that fairly large retentions were made.

The data on 381 companies support the conclusion that small- and medium-sized corporations performed relatively much greater dissaving during the thirties than did large concerns. The 381 companies differ from

<sup>28</sup> Since the difference between reported and adjusted net income of these companies is very small, only the adjusted data are presented in Panels C and D.

<sup>29</sup> Again comparing the cyclical peak year of the early twenties with that of the late twenties, it is found that in 1923 approximately \$2 million was retained out of net income of \$3.7 million (or 55 percent), while, in 1929, \$.8 million was retained out of net income of \$3.3 million (or 24 percent).

the Wisconsin concerns in this respect, however: they show a much greater degree of recovery in net income and dividends in 1936, relative to the levels of the late twenties. In fact, these corporations paid a slightly larger amount of dividends in 1936 than they did in 1929.

Net income and retained income of the Wisconsin companies are correlated in Charts 8 and 9, one showing relations between dollar amounts and the other between rates. The correlation charts for 381 companies are not reproduced here, but the regression equations and the coefficients of correlation for both samples are given in Table 2.<sup>30</sup> The results obtained for the two samples do not differ appreciably from each other. In both cases, retained income tended to give place to net dissaving as net income declined to a level below 4 percent of net worth. A change of 1.0 percentage point in the rate of net income companies was associated, on the average, with a change in the same direction of approximately 0.8 percentage point in the rate of retained income. These findings are closely similar to those presented for all manufacturing companies and for a sample of large manufacturing concerns.

A more detailed comparison of the "propensity to retain" of large and small corporations is presented in Table 3, which contains "computed values" of retained income for various levels of net income. It can be seen that retentions are generally higher for both Wisconsin companies and the 381 companies than for large corporations, but the differences are not pronounced.

Finally, it should be noted that a difference is observable between the retentions of the Wisconsin corporations and those of large concerns when the trend over the entire period covered by the data is considered. While data for the large companies, as stated above, indicated a slightly *downward* trend, our analysis of the Wisconsin data indicates a small upward tendency (that is, a tendency to retain more at a given level of income in the later, than in the earlier, years of the period).<sup>31</sup>

#### SUMMARY OF CONCLUSIONS

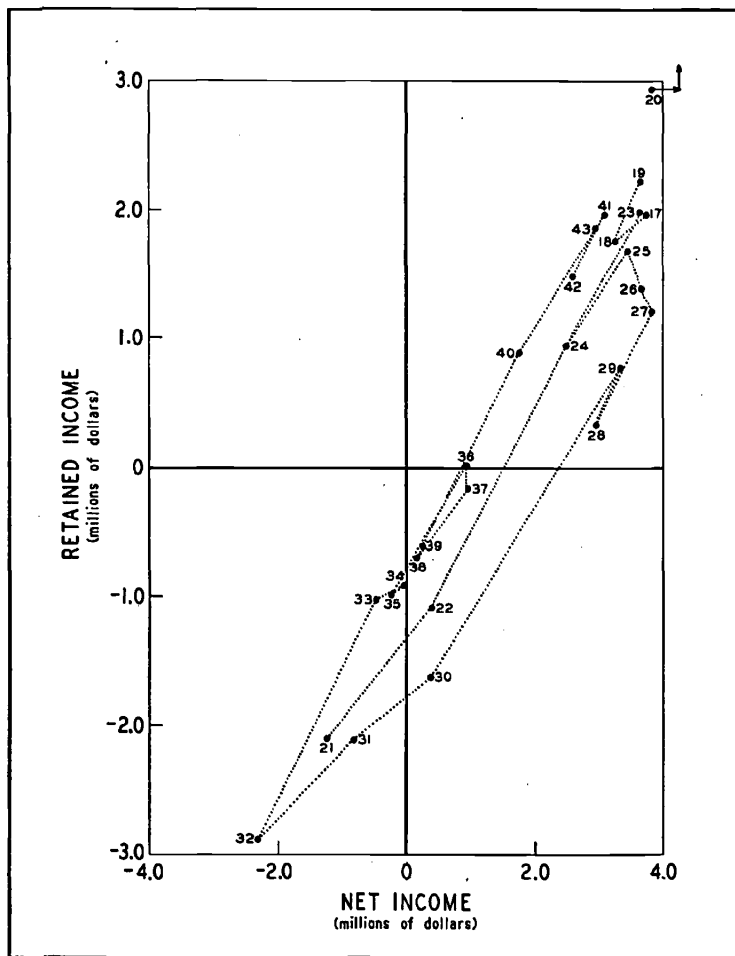
1. The data for large- and for small- and medium-sized manufacturing corporations reveal generally similar patterns of relationship between net

<sup>30</sup> The simple regressions for the small companies do not, of course, take into account the influence of past income or dividends.

<sup>31</sup> When time is introduced as a separate variable, the following equation is obtained for the Wisconsin companies over the period 1917-43 (the years 1936 and 1937 omitted):

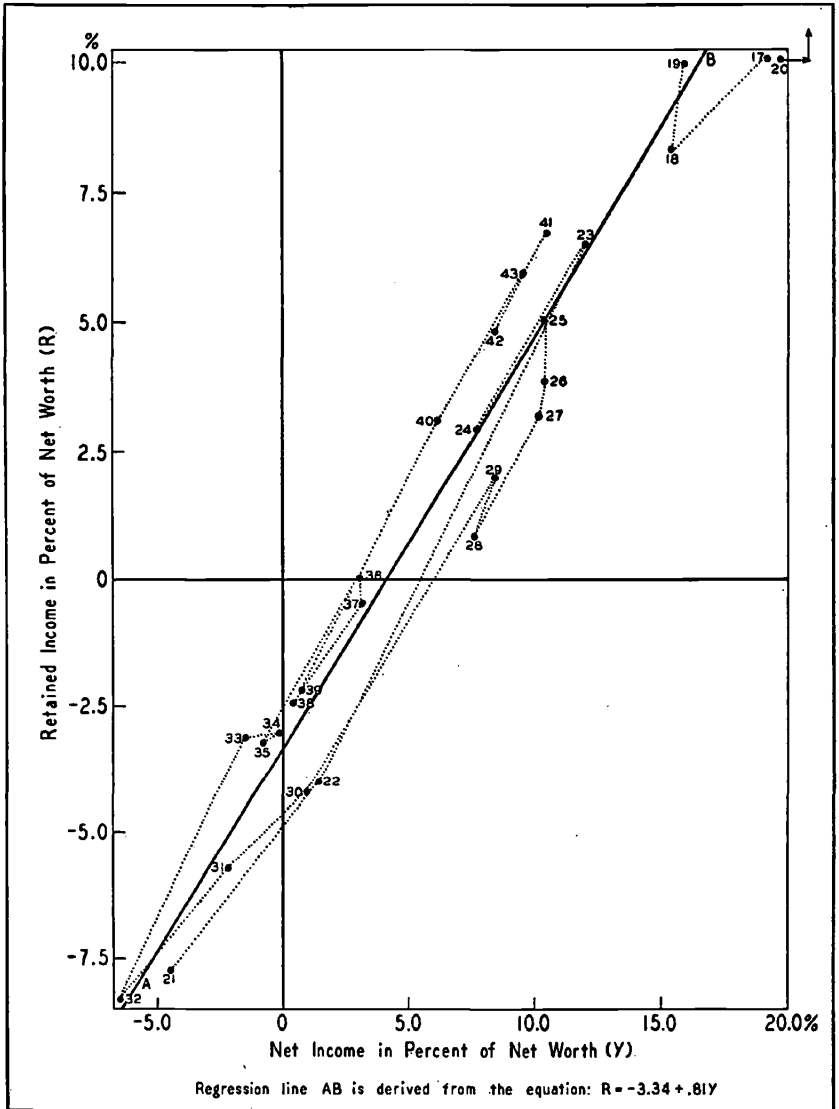
$$R = -5.28 + .87Y + .12t \\ \pm .03 \quad \pm .03$$

Chart 8—THE RELATION BETWEEN AMOUNTS OF NET INCOME AND RETAINED INCOME, SAMPLE OF SMALL- AND MEDIUM-SIZED WISCONSIN CORPORATIONS, 1917-43



Retained income varies directly with net income, but considerable differences can be seen between various parts of the period 1917-43.

Chart 9—THE RELATION BETWEEN RATES OF NET INCOME AND RETAINED INCOME, SAMPLE OF SMALL- AND MEDIUM-SIZED WISCONSIN CORPORATIONS, 1917-43



The rates of retained income were directly related to the rates of net income. Saving occurred at net income rates over 5 percent, while dissaving was registered at lower rates.

Table 3—RETAINED INCOME RATES COMPUTED FROM REGRESSION EQUATIONS FOR LARGE AND SMALL COMPANIES <sup>a</sup>

Rate of Net Income	Computed Rate of Retained Income		
	Large Com- panies	Small Com- panies (Wisconsin)	381 Small Companies
0%	-3.3%	-3.3%	-2.9%
2	-1.8	-1.7	-1.4
4	-.3	-.1	.1
5	.4	.7	.9
8	2.6	3.1	3.1
10	4.1	4.8	4.6
15	7.8	8.8	8.4

<sup>a</sup> The following equations have been used for this computation:

$$\text{Large corporations, 1917-43: } R = -3.30 + .74Y$$

$$\text{Wisconsin corporations, 1917-43: } R = -3.34 + .81Y$$

$$\text{381 corporations, 1926-36: } R = -2.89 + .75Y$$

The equation for large companies is slightly different from the one given in Table 2, because of the omission of the years 1915 and 1916 and the inclusion of the years 1936 and 1937. These adjustments were made so as to make the period covered identical for large and Wisconsin small corporations.

income and retained income: 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.

2. A difference is found, however, in the fact that a small downward trend in income retentions, made at given levels of income, is observed in the case of large companies, while an upward trend is evident in the case of small- and medium-sized companies (as represented by the sample materials).

3. An analysis of the data on large corporations reveals that, apart from the influence of net income, retentions have also been affected by dividend requirements, as indicated by the level of the preceding period's disbursements: a difference of 1.0 percentage point in the preceding year's dividend rate was associated, other things being equal, with a difference of -0.3 percentage point (approximately) in the current rate of retained income.

4. A significant relation has also been found between income retentions and the rate of operating asset expansion. On the other hand, the data reveal no clear relation between current retentions and previously accumulated surplus and reserves.