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## DEPENDENCE ON INTERNAL AND EXTERNAL FINANCING AT VARIOUS RATES OF ASSET GROWTH

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THE causal relationships among corporate net income (total and retained), asset expansion and the flow of external funds are very complex. Reasons could easily be given for expecting corporate income both to influence asset expansion and to be affected by it, but a detailed and thorough analysis of these interrelationships would be beyond the scope of this study.<sup>1</sup> Even apart from the problem of causation, however, it is important to answer such questions as: At what rates of expansion has retained income been sufficient to cover physical or total asset requirements? Have the relationships been similar for large and small corporations? Has there been any notable change in these relationships over long periods of time?

In analyzing the relationship among corporate saving, external financing, and corporate investment, year-to-year variations in each of these quantities will be considered, using data on all manufacturing and mining companies combined and sample data for large and for small- and medium-sized companies. Next, intercompany differences will be examined; in this case sample data for large manufacturing corporations only are used.

### ALL MANUFACTURING AND MINING CORPORATIONS

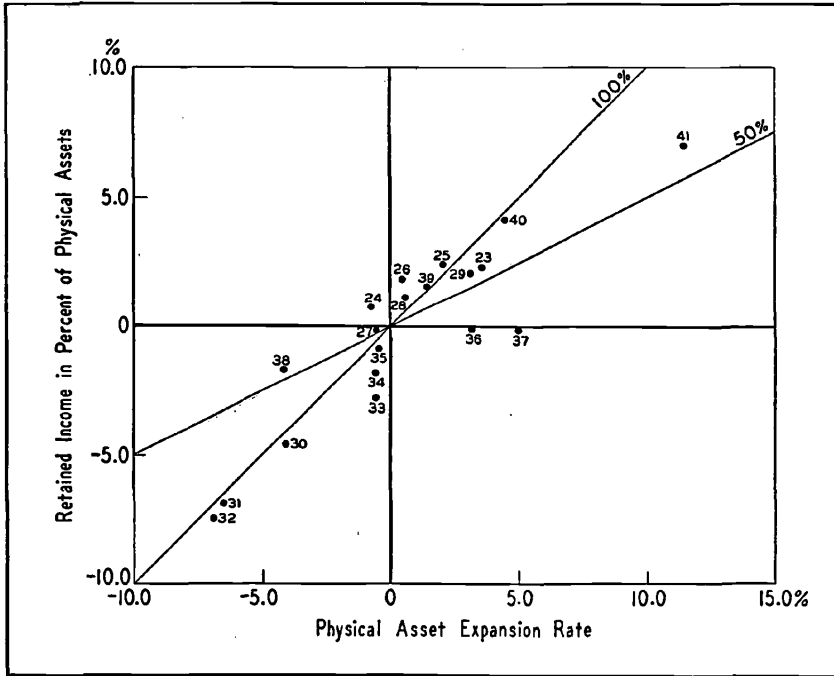
The relationship between corporate saving and physical asset expansion over the period 1923-41 is shown in Chart 19 for all manufacturing and mining corporations combined.<sup>2</sup> While high rates of asset expansion

<sup>1</sup> The multiple regression equations, given in Chapter 5, do not indicate a close net relationship between the rates of operating asset expansion and retained income; but the evidence is not altogether conclusive because of the intercorrelation of variables.

<sup>2</sup> In this and other charts where retained income is correlated with physical asset expansion, both variables are expressed as percentages of physical assets at the beginning of the year.

In the charts where retained income is correlated with total asset expansion, both variables are expressed as percentages of total assets at the beginning of the year.

Chart 19—THE RELATION BETWEEN RATES OF PHYSICAL ASSET EXPANSION AND RETAINED INCOME, ALL MANUFACTURING AND MINING CORPORATIONS, 1923-41



In general, retained income varied directly with physical asset expansion in the period 1923-41, although considerable dissimilarity is found between different parts of the period.

were generally associated with high rates of income retention, there is a wide dispersion of observations, making it impossible to describe accurately the relationship for the entire period by a single regression line.<sup>3</sup>

<sup>3</sup> It may be noted that a definite straight-line pattern of relationship is indicated by the data for the twenties (1923-29) and also for the late thirties and early forties (1938-41). The intervening period (1930-37), which comprises the severe depression of the early and middle thirties and the years in which the undistributed profits tax was in effect, does not conform to this pattern. In the years of physical asset contraction (1930-35) net dis-saving by corporations was substantially in excess of what would have been expected from their characteristic behavior in the twenties, and in the years of physical asset expansion (1936-37) no income retention was registered by companies as a whole.

Certain general characteristics of behavior can, however, be noted, with the help of the "100 percent" and "50 percent" lines drawn in the chart. The 100 percent line indicates the points at which retained income would equal exactly the funds used for physical asset expansion (there being, on balance, no external financing); the 50 percent line indicates the points at which retained income would equal exactly one-half of the funds absorbed in physical asset expansion (external financing being responsible for the other half). It can be seen that in the years of relatively low expansion rates (for example, 1925-26, 1928, 1939) retained income was more than adequate as compared with net physical investment. In contrast, at higher rates of growth (for example, 1923, 1929, 1940-41) retained income fell short of physical investment requirements, and a considerable amount of external financing was absorbed. Even when the rate of expansion was highest, however, the absolute amount of retained income exceeded the net amount of external financing absorbed. Thus in 1941, when the rate of expansion was 11.4 percent, retained income accounted for 60 percent, and net balance of external financing for 40 percent, of the total new funds absorbed.

### LARGE MANUFACTURING CORPORATIONS

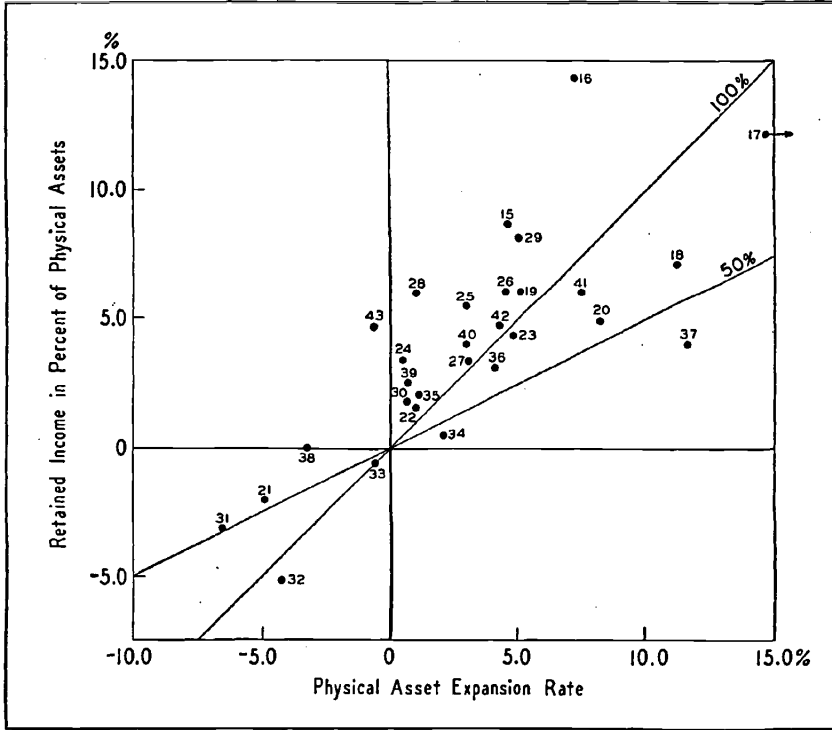
The more detailed data available for our sample of large manufacturing corporations make it possible to study the relation of retained income to total asset expansion as well as to physical asset expansion, and to examine accrued liabilities as a source of funds for corporate asset growth.

#### *Physical Asset Expansion and Retained Income*

The relation between the rate of expansion of physical assets and income retention by large manufacturing corporations over the period 1915-43 is shown in Chart 20.<sup>4</sup> As for all manufacturing and mining companies, high rates of asset expansion were generally associated with high rates of income retention. The dispersion of observations, however, is even wider than in Chart 19 for all companies combined. Thus, retained income was exceptionally high relative to physical asset expansion in 1915 and 1916, but in the following two years the relative importance of retained income declined sharply as a result of substantial increases in the rate of asset expansion unaccompanied by increased retentions. Unlike

<sup>4</sup> The data in Chart 20 are for the sample of 31-45 large manufacturing corporations, which is described in Appendix A.

Chart 20—THE RELATION BETWEEN RATES OF PHYSICAL ASSET EXPANSION AND RETAINED INCOME, SAMPLE OF LARGE MANUFACTURING CORPORATIONS, 1915-43



In almost all years when the expansion rate is relatively low, retained income substantially exceeded total funds used for physical asset expansion. At higher expansion rates, however, the reverse was true.

all companies combined, the rate of income retention of large corporations exhibited an upward trend during the twenties, though the rate of physical asset expansion did not; by 1929 retained income rates had reached a level almost double that of 1923, while the rate of physical asset expansion was approximately the same in both years.<sup>5</sup>

<sup>5</sup> This is interesting in connection with the view that heavy corporate income retentions in the twenties accelerated the rate of investment and contributed to the "boom and bust" developments. While it does not provide conclusive proof, it speaks against this view, at least for large manufacturing corporations.

On the other hand, in the period 1930–37 there is a similarity between large concerns and all corporations combined; net dissaving was especially heavy during the years of asset contraction, and income retentions were relatively small during the years of asset expansion.<sup>6</sup> Again, in the years 1938–42 the relation between rates of physical asset expansion and income retention for large manufacturing corporations was close to that of the early twenties, but in 1943 there was a pronounced shift: physical assets contracted while income retention continued at virtually the same level as in 1942.

In general, it can be stated that in years of moderate physical asset expansion income retentions tended to be so high as to enable corporations to engage in a substantial net release of external financing. In contrast, in years of rapid physical asset growth retained income was less than physical investment requirements, and there was a considerable net absorption of funds from external sources. True, retained income increased as the expansion became more rapid; but the additional retentions tended to fall short of investment increments at high expansion rates. It should be noted, though, that with only one exception (the year 1937) retained income provided more than 50 percent of total financing even at the highest rates of growth.

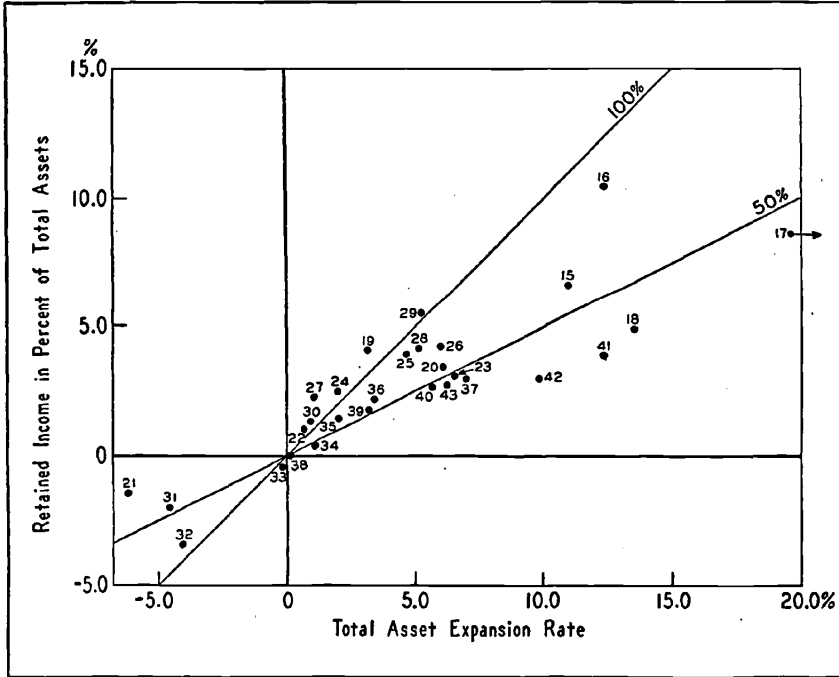
#### *Total Asset Expansion and Retained Income*

The relative importance of retained income in the total funds used for asset growth is naturally smaller when it is compared with total asset expansion than when it is compared with physical asset expansion, but the general pattern of relationship is similar in both cases. Retained income increases with increases in the rate of asset expansion, but additional retentions fall short of additional outlays for expansion.

The dispersion of observations is smaller when retained income is related to total asset expansion than when it is related to physical asset expansion, as can be observed by comparing Chart 20 with Chart 21, but the two charts display a number of similarities in year-to-year movements. In both cases, retained income was high relative to asset expansion in 1915 and 1916, but decreased substantially in 1917 and 1918. Retentions increased relative to both physical asset and total asset expansion toward the end of the twenties. Again, both charts show relatively heavy net dissaving or relatively low retentions during the period 1930–37. On the

<sup>6</sup> The difference between 1930–37 and the twenties is less pronounced in the case of large companies than for all companies combined.

Chart 21—THE RELATION BETWEEN RATES OF TOTAL ASSET EXPANSION AND RETAINED INCOME, SAMPLE OF LARGE MANUFACTURING CORPORATIONS, 1915-43



Retained income varied directly with total asset expansion. In most years retentions fell short of the total amount of funds absorbed in the expansion of assets, especially when the expansion rate was high.

other hand, the two charts differ from each other with respect to the years 1941-43: retentions appear to be low in those years, when considered in relation to total asset expansion, but not when considered in relation to physical asset expansion.

Although the dispersion of observations is wide, the general tendency is fairly clear for retained income to supply a lower proportion of funds needed for expansion at high rates of total asset expansion than at low rates. Generally speaking, external financing, taken gross of changes in financial assets, was substantial in relation to internal financing; in a

number of years it considerably exceeded the amount of income saved. As already indicated, however, a large part of the newly obtained resources was passed on to other sectors of the economy through the acquisition of financial assets.

### *Importance of Accrued Liabilities*

As stated in Chapter 2, in this study accrued liabilities are generally considered as part of short-term external financing; yet, undeniably, accruals and retained income are similar in the sense that both are accumulated out of a company's own revenue stream, and thus the question arises whether a definite relationship exists between the combined amount of retentions and accruals (other than depreciation) on the one hand and asset expansion (net of depreciation) on the other. The data presented in Chart 22 answer this question affirmatively. The inclusion of accrued liabilities changes the amount of internal financing only moderately during the interwar period, but quite substantially in both war periods (mainly on account of heavy wartime tax accruals). With respect to the war years, it is interesting to note that an increase in accruals was associated with a downward shift in income retentions (relative to asset expansion). As Chart 21 shows, retained income in the years 1918 and 1941-43 was markedly below the level that would have conformed to the general pattern for the interwar period; but when retentions and accruals combined are correlated with total asset expansion, this discrepancy disappears and both the war and peace years exhibit a generally similar pattern.

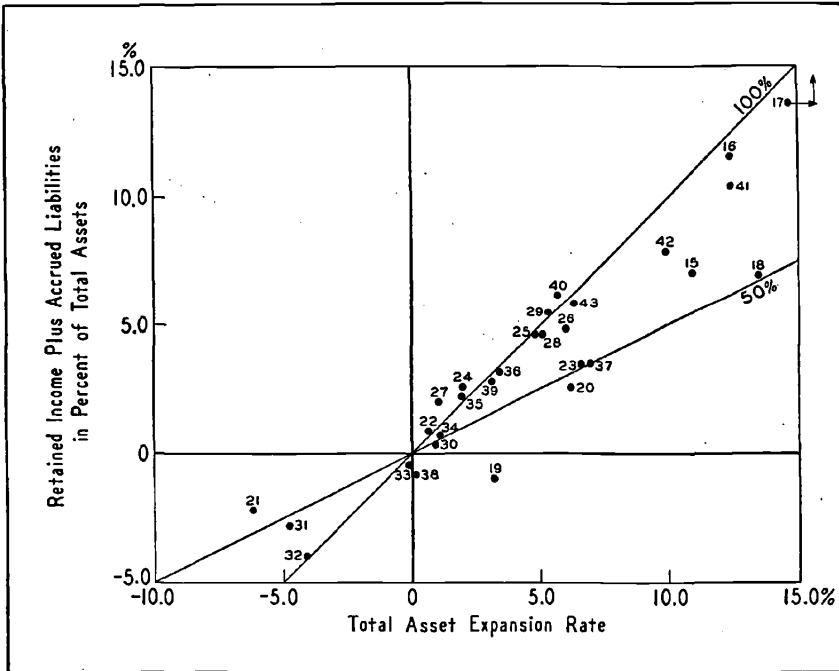
In general, retentions and accruals combined represented a very substantial (in fact, in many years a predominant) source of financing total asset expansion, even in periods of heavy investment outlays. In a number of years of relatively low rates of expansion the funds obtained from this source exceeded the needs for total asset expansion. At high expansion rates funds from other sources were also absorbed, although even then their contribution was not always substantial.

### SMALL- AND MEDIUM-SIZED MANUFACTURING CORPORATIONS

Our sample of small- and medium-sized companies makes it possible to examine the relationship between retained income and both physical and total asset expansion. The role of accrued liabilities in the financing of asset growth can also be studied.



Chart 22—THE RELATION BETWEEN RATES OF TOTAL ASSET EXPANSION AND RETAINED INCOME PLUS ACCRUED LIABILITIES, SAMPLE OF LARGE MANUFACTURING CORPORATIONS, 1915-43



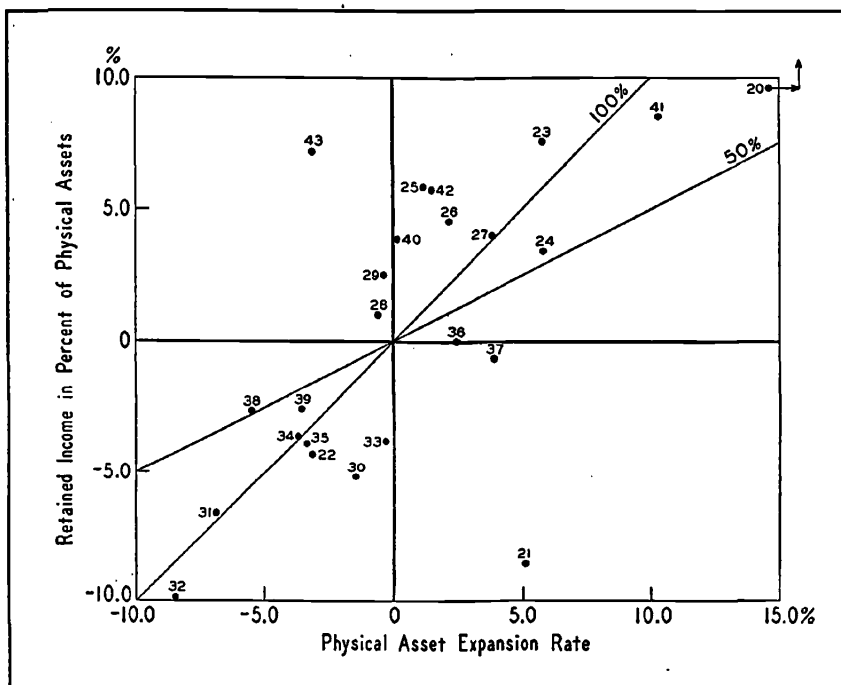
The inclusion of accrued liabilities with retained income brings the war years into closer conformity with the interwar period, with respect to the relation between internal financing and total asset expansion.

*Physical Asset Expansion and Retained Income*

The relationship between income retention and physical asset growth for small- and medium-sized corporations over the period 1920-43 is shown in Chart 23.<sup>7</sup> It can be observed that these companies saved more at high than at low rates of asset expansion, though the dispersion of observations is quite wide, even for the interwar period alone. Unlike large corporations, small- and medium-sized companies did not tend, toward the end of the twenties, to increase their savings relative to their physical asset expansion. In the thirties, on the other hand, there is similarity

<sup>7</sup> See Appendix A for a description of the sample of companies used.

Chart 23—THE RELATION BETWEEN RATES OF PHYSICAL ASSET EXPANSION AND RETAINED INCOME, SMALL- AND MEDIUM-SIZED WISCONSIN CORPORATIONS, 1920-43

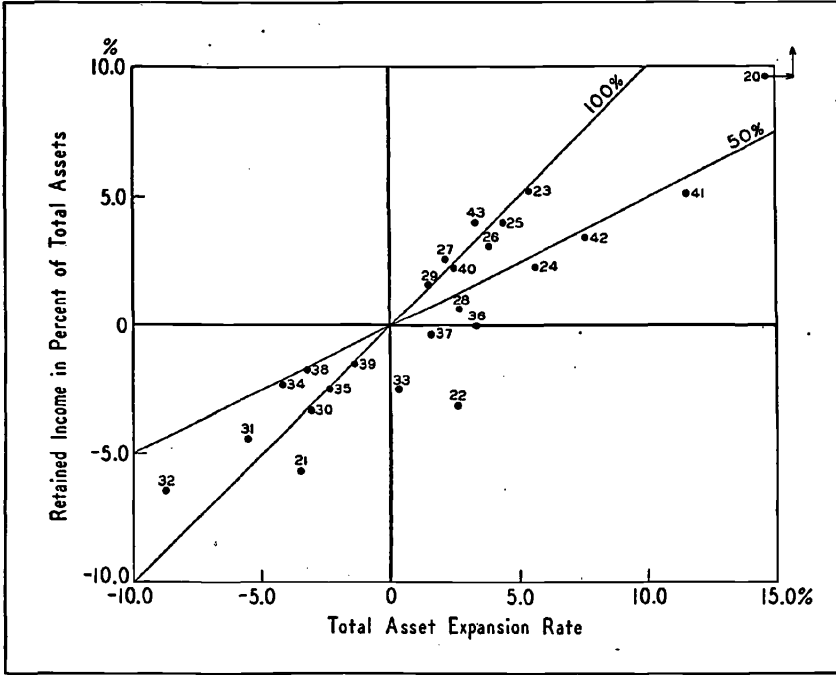


In general, retentions of small companies were directly related to their physical asset expansion, but a wide dispersion of observations may be noted.

between the two groups of companies in that net dissaving was especially heavy relative to asset contraction in 1930-35, and retentions failed to move "in step" with asset expansion in 1936 and 1937. In both groups of companies, the relationship between physical asset expansion and retained income in 1938-42 was fairly close to the one characteristic of the twenties, although physical asset contraction in 1943 was not accompanied by any decrease in retained income.

The savings of small companies in most years were substantially in excess of their needs for physical asset expansion. Only in two years (1924 and 1941) did retained income fall short of physical asset expansion. On the other hand, unlike large corporations, small- and medium-sized con-

Chart 24—THE RELATION BETWEEN RATES OF TOTAL ASSET EXPANSION AND RETAINED INCOME, SMALL- AND MEDIUM-SIZED WISCONSIN CORPORATIONS, 1920-43



Except in a few years, retentions fell short of total funds absorbed in asset expansion. Absorption of external financing was especially heavy at high expansion rates.

cerns absorbed a considerable amount of external funds, on balance, in most of the years in which the physical assets of this group of companies contracted. Owing to the wide scatter of observations, it is hard to discern any tendency for retained income to change relative to external financing as the rate of physical investment increased.

*Total Asset Expansion and Retained Income*

Retentions of small companies, like those of large concerns, were more closely related to the rate of total asset expansion than to the rate of physical asset expansion, as can be observed by comparing the dispersion of observations in Charts 23 and 24.

During most of the twenties retained income provided a very substantial part of the funds used to finance total asset expansion; in fact, in 1923, 1927 and 1929 no external financing was absorbed at all. The first half of the thirties was characterized by total asset contraction and net dissaving. As to the second half of that decade, moderate asset expansion is found in 1936 and 1937, which was financed entirely from external sources (those were the two years in which the undistributed profits tax was in effect). In 1938 and 1939, however, asset contraction and dissaving were again in evidence. In the early forties, retained income was more than adequate to meet total investment requirements when the rate of total asset expansion was relatively low (as in 1940 and 1943), but external financing was resorted to on a substantial scale in the years of rapid asset growth (1941 and 1942).

#### *Importance of Accrued Liabilities*

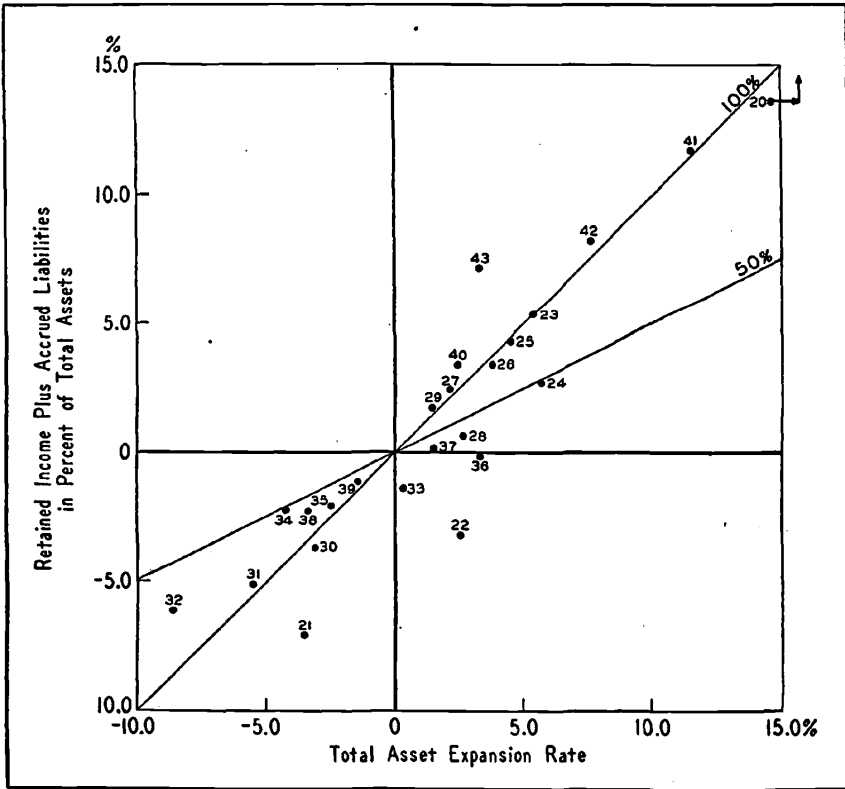
The relationship between total asset expansion and the sum of retained income plus the accrual of "other liabilities" is shown in Chart 25. As with large companies, the inclusion of accrued liabilities as a component of internal financing results in little change in the relationship during the interwar period, but causes considerable shift in the years 1941-43, when tax accruals were large. Again, the inclusion brings the war years into better conformity with the general pattern for the entire period 1920-43.

In the case of small- and medium-sized companies, we find that the sum of retentions and accruals increased, in general, only a little less rapidly than outlays for total asset expansion. In most of the years in which total assets expanded, the sum of retentions and accruals represented four-fifths or more of the entire amount of funds used for expansion purposes by these companies.

#### *Financial Behavior of Large and Small Companies Compared*

In general, the patterns of behavior of large and small companies with respect to financing asset expansion are found to be similar. Both groups relied predominately on income retention in periods of low or moderate investment requirements, and absorbed large amounts of external funds—in addition to substantial retentions—when the rates of asset growth were high. Small- and medium-sized firms experienced asset contraction and dissaving in many more years than the large companies, but, if attention is confined to expansion years alone, the retentions made by the small companies are, in general, found to be approximately equal to, or in some

Chart 25—THE RELATION BETWEEN RATES OF TOTAL ASSET EXPANSION AND RETAINED INCOME, PLUS ACCRUED LIABILITIES, SMALL- AND MEDIUM-SIZED WISCONSIN CORPORATIONS, 1920-43



The inclusion of accrued liabilities with retained income strongly affects the situation in the war years 1941-43, but has little effect in the interwar period.

cases greater than, the retentions of large concerns with comparable rates of asset expansion.

The data for the two groups reveal some differences with respect to the time trend. When Charts 21 and 24 are compared from this standpoint, it will be observed that the dots for the thirties and forties tend to lie below those for the twenties in the case of large companies but not for the small ones. In other words, the large concerns exhibited a tendency to retain less relative to their total investment requirements in the later years

of the period studied; small companies do not show a similar trend.

Owing to the wide dispersion of observations for both large and small corporations, regression lines have not been fitted for the entire periods studied. The dispersion, however, is considerably reduced if attention is confined to the period 1921-41. Regression equations, showing the relationship between retained income and total asset expansion, have been computed for this period, with the following results:

$$\begin{aligned} \text{Large companies: } R &= 1.71 + .50G - .12t \\ &\pm .05 \quad \pm .04 \end{aligned}$$

$$\begin{aligned} \text{Small companies: } R &= -1.01 + .65G + .02t \\ &\pm .09 \quad \pm .06 \end{aligned}$$

where  $R$  is the rate of retained income,  $G$  is the rate of total asset expansion, and  $t$  represents time (both  $R$  and  $G$  are expressed as percentages of total assets at the beginning of the year).

These equations summarize conveniently the behavior characteristics discussed above. They show that the retained income of both large and small concerns varied directly with total asset expansion, but that additional retentions fell short of investment increments, necessitating recourse to external financing at higher expansion rates. They also indicate the existence of a significant downward trend for the large companies, but not for the small ones.

#### INTERCOMPANY DIFFERENCES IN THE RELATION BETWEEN INCOME RETENTION AND ASSET GROWTH

In conclusion, it remains to be considered whether differences between individual companies in the extent to which they have depended on internal versus external financing have been consistently related to differences in their respective rates of asset growth. There is no clear pattern of relationship when single-year data for a sample of large manufacturing corporations are considered.<sup>8</sup> Some companies show predominant dependence on internal financing while others, expanding at similar rates, show heavy absorption of external funds.

Even when the data for several consecutive years are combined, the dispersion of observations remains very wide; yet some broad general tendencies may be noted. Two eight-year periods (1922-29 and 1933-40)

<sup>8</sup> See Appendix A for a description of this sample.

have been selected for the intercompany analysis, and the results are discussed in the following two sections. Average annual rates of physical asset expansion, total asset expansion and retained income have been computed for this analysis.<sup>9</sup>

#### *Corporate Saving and Physical Asset Expansion*

There is considerable difference between the periods 1922–29 and 1933–40 in the extent to which large manufacturing corporations were able to provide the resources needed for the financing of physical asset expansion out of their own savings. In the period 1922–29 the retained income of most companies was high relative to their net physical investment. Even at high rates of physical asset expansion, retentions proved to be a very substantial source of financing. Out of 70 companies included in the sample 45 retained income in excess of physical asset expansion, 14 companies made retentions amounting to between 50 and 100 percent of the expansion, and only 4 companies made retentions which were less than 50 percent of the expansion; 7 companies incurred net dissaving during the entire eight-year period (see Chart 26, Panel A).

In contrast, retained income provided a much smaller proportion of the means necessary for the financing of physical asset growth during the years 1933–40, even though the rates of growth were relatively moderate in that period. Among the 70 companies in our sample, we find 22 that retained income in excess of physical asset expansion needs, 17 whose retained income amounted to from 50 percent to 100 percent of their expansion, and 13 whose retained income was less than 50 percent of their expansion. Eighteen companies experienced net dissaving in 1933–40, and it is interesting to note that as many as 13 of them managed to expand their physical assets during those years by means of external financing.

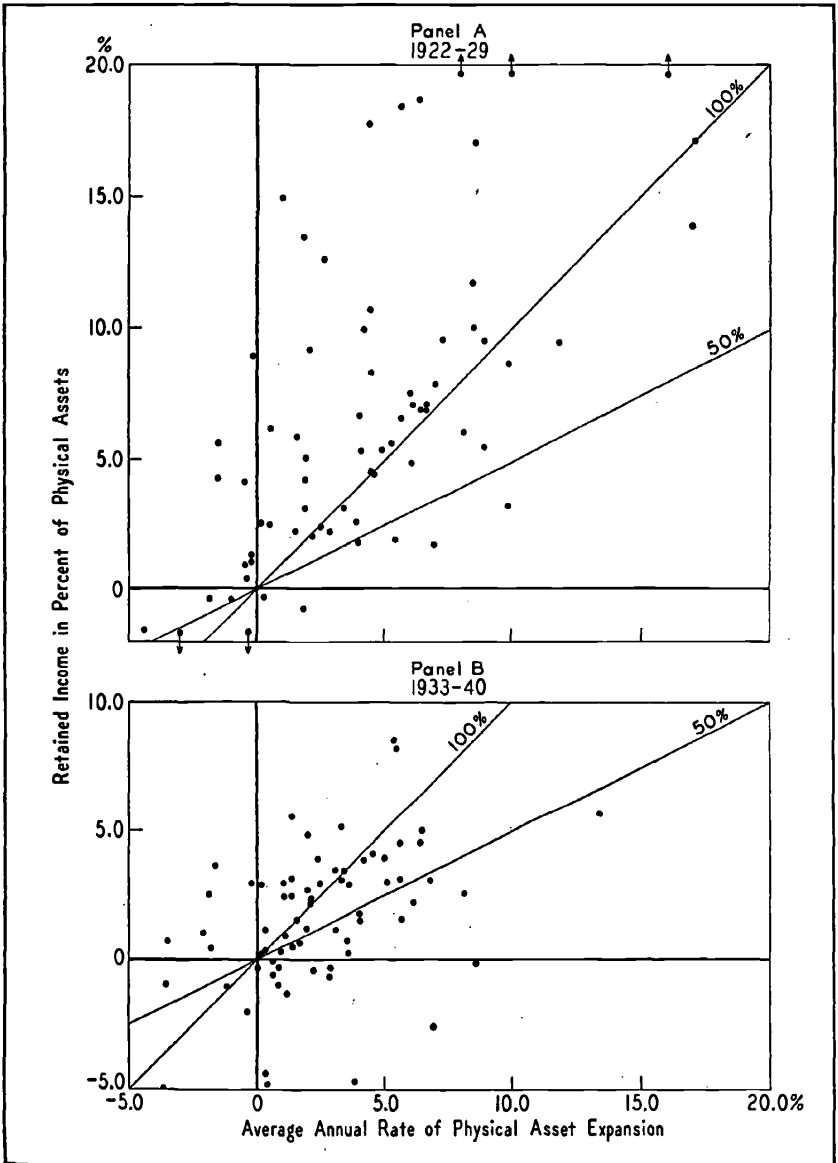
#### *Corporate Saving and Total Asset Expansion*

During the twenties large manufacturing corporations accumulated financial as well as physical assets—mainly in the form of securities of

<sup>9</sup> The average rates of physical asset expansion were computed by taking the ratio of the sum of eight annual amounts of physical asset expansion to the sum of eight amounts of physical assets (at the beginning of each year). Average rates of total asset expansion were computed by a similar process.

The average rates of retained income are ratios of the sum of eight annual amounts of retained income to the sum of eight amounts of physical assets (at the beginning of each year) or to the sum of eight amounts of total assets (at the beginning of each year), depending on whether income retention rates are being correlated with physical or with total asset expansion.

Chart 26—THE RELATION BETWEEN RATES OF PHYSICAL ASSET EXPANSION AND RETAINED INCOME, 1922-29 AND 1933-40, FOR 70 LARGE MANUFACTURING CORPORATIONS



Retained income was, in general, substantially greater relative to physical asset expansion in the twenties than in the thirties.



subsidiaries—at a rapid rate. As a result, few concerns were able to finance their total asset expansion entirely out of their income stream. As Panel A of Chart 27 shows, the retained income of only 15 companies out of 70 in our sample exceeded their total asset expansion, while the retained income of 28 amounted to between 50 and 100 percent of their expansion, and the retained income of 20 amounted to less than 50 percent of their expansion. Seven companies, as already mentioned above, registered net dissaving during the years 1922–29.

In the thirties, corporate saving was, in general, smaller relative to total asset expansion. As can be seen in Chart 27, retentions of 11 companies exceeded their total asset expansion, retentions of 19 companies were between 50 and 100 percent of their expansion, and retentions of 22 companies were below 50 percent of their expansion. Net dissaving was incurred by 18 companies during the years 1933–40, which did not prevent 9 of them from expanding their total assets by means of external financing.

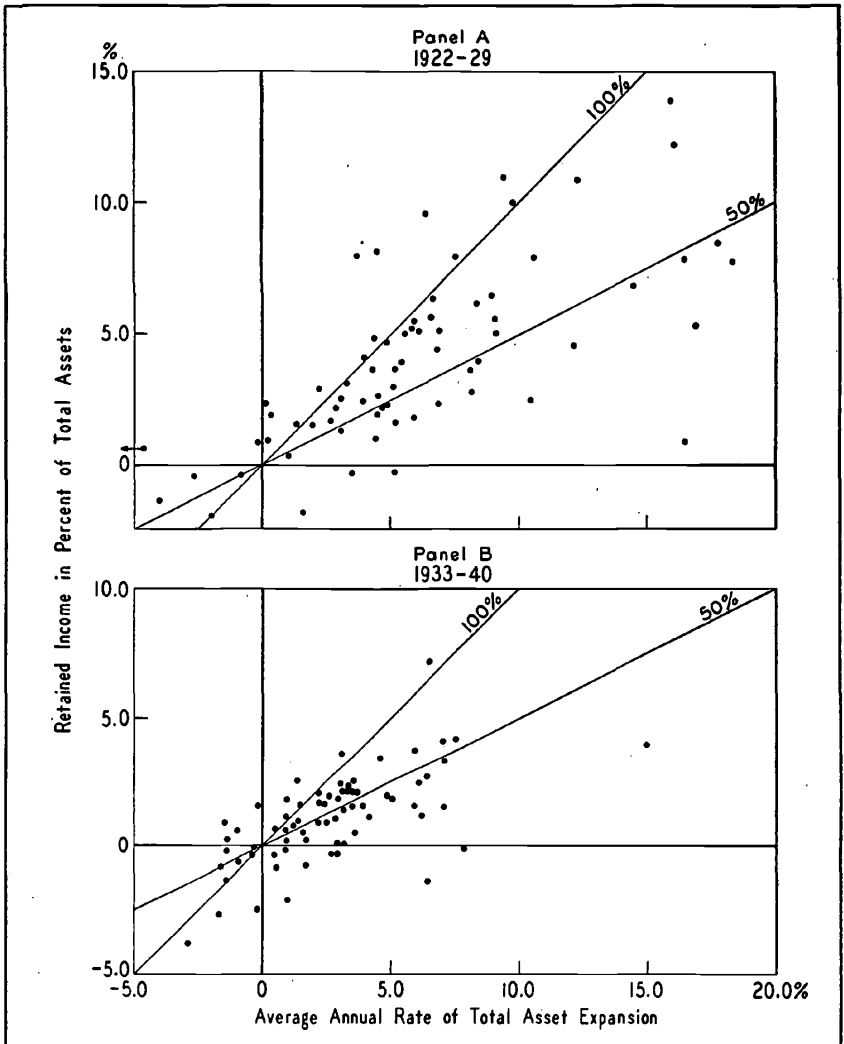
The difference between the two periods is less pronounced when retained income is related to total asset expansion than when it is related to physical asset expansion. This is accounted for by the companies' behavior with respect to financial assets: in the twenties, as already mentioned, financial assets were accumulated rapidly, which tended to increase total investment requirements relative to income retentions; in the thirties, on the other hand, there was no appreciable accumulation of financial assets. The dispersion of observations is wide in both the twenties and the thirties. Yet, a tendency may be observed in both periods for the companies, whose retentions equaled or exceeded their total investment needs, to be concentrated in the lower profits range.

#### SUMMARY OF CONCLUSIONS

1. The relative importance of retained income and external financing absorbed by manufacturing corporations during the years 1915–43 varied with the rate of their asset growth. While, in general, these companies increased their use of internal and external funds during the years of rapid asset expansion, the tendency is observable for external funds to be of greater relative importance at higher than at lower expansion rates. This is true with respect to the growth both of physical assets alone and of total assets (including those of a financial nature).

2. The differences between the performance of large and small corporations were not pronounced. Large corporations, however, exhibit a

Chart 27—THE RELATION BETWEEN RATES OF TOTAL ASSET EXPANSION AND RETAINED INCOME, 1922-29 AND 1933-40, FOR 70 LARGE MANUFACTURING CORPORATIONS



In 1922-29 a much greater proportion of corporations relied exclusively or predominantly on retained income in financing total asset expansion than was the case in 1933-40.

tendency to use more external financing in the later than in the earlier years (at comparable expansion levels), while small companies fail to exhibit this trend.

3. A comparison of the behavior of individual large corporations in given periods shows that, in general, companies with greater expansion rates depended more heavily on external financing than companies with lower expansion rates. During the twenties (1922-29), many large corporations made retentions in excess of their investment requirements; in the thirties (1933-40), the number of such companies was relatively small.

