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Volume Author/Editor: Ralph C. Epstein assisted by Florence M. Clark

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CHAPTER 7

CYCLICAL FLUCTUATIONS *(Continued)*

1. RATE OF EARNINGS IN MINOR MANUFACTURING GROUPS

THE 71 corporations series analyzed in the latter part of the preceding chapter, containing data that run through 1931, cannot be subdivided into individual industries or minor groups. Our 2,046 large manufacturing corporations series running from 1919 through 1928, can, however, be so treated. Furthermore, it will be recalled that we have sales data available for this series as well as income and investment figures. This chapter seeks to examine these three items, sales, income and investment, in terms of comparative growth or decline, by individual minor groups of industry. The reader is referred to Table 12 if he wishes to refresh his recollection of the full classification of 73 industries into which the several major manufacturing groups have been divided.[1] Our purpose at this point is not to discuss or even to mention in turn each one of these groups as is done in Book II, but rather to summarize the situation concerning the types of behavior shown by their several curves, and to chart the series that deserve particular attention.

Before commencing the analysis, some remarks about the nature of the period are pertinent. While business men often

[1] These 73 *industries* should not be confused with the 71 *companies* discussed in the preceding chapter.

termed 1922–29 a period of 'profitless prosperity', the expression was a misnomer. In nearly all industries, some years were quite profitable, some less so, but for no industry was the period as a whole 'profitless'. The expression was derived from the fact that although the volume of business increased in many lines, commodity prices failed to advance appreciably—indeed, in comparison with the War and immediate post-War years, prices were remarkably stable during the entire 1922–28 period. However, the volume of production in most lines showed a general increase between 1922 and 1928. Although this growth was in no sense steady, in many industries it was persistent; the checks administered in 1924 and 1927 were more than overcome in succeeding years. This growth of general business, particularly towards the end of the period when it became confused with a concomitant and more dramatic expansion of stock market speculation and a rise in stock prices, then caused the period as a whole to be popularly thought of as one of marked prosperity. Talk of 'profitless prosperity' subsided, and towards the end of 1928, only 'prosperity' was mentioned. And after the crisis of 1929–30, it became common to regard an alleged 'increasing profitableness' of industry during the years 1922–29 as a cause of the 1929–30 collapse.

We have in this chapter to examine the course of profit rates, of sales and of investment in manufacturing industries during the years in question. Our interest is not only in seeing what were the cyclical fluctuations of 1923–24, 1926–27 or 1929–30, but also in examining the 1922–28 period as a unit. (For our 2,046 corporations, the 1929 data, unfortunately, are not available.)

In terms of strict business cycle theory, the years 1922–28 are not, of course, a unit. They begin with a year of recovery from severe depression, cover one full cycle (1924–27),

and end with a year of recovery from mild depression. Nevertheless, from the point of view of the business man interested in the expansion or contraction of the fixed capital investment in his enterprise or industry, the years 1922–28 possess certain characteristics which stamp them as 'good years'. For many products, the market grew greatly. For many lines of production, new and markedly cheaper processes, often involving greatly increased mechanization, were developed. And finally during 1922–28, despite the cyclically low years of 1924 and 1927, no severe and sustained general depression was encountered. For these reasons it seems to us desirable to examine the period as a unit as well as to note its year-to-year cyclical aspects; and it seems not inaccurate, likewise, to describe it as a period of good times, bearing in mind, of course, that the prevailing prosperity was in no sense unbroken.[2]

During 1922–28, then, we find that most of our 73 manufacturing industries showed no general increases in earnings upon investment.[3] Fifteen industries, or about one-fifth of

[2] The recessions of 1924 and 1927, while sharp in their effects on corporate earnings, were not so violent as to belie the statement that 1922–28 constituted 'a prosperous 7-year period'. Dr. Mitchell points out that the data analyzed in this chapter are annual, not monthly, figures and therefore do not match the cyclical turning points very well. He observes that what he would expect is not an increase in 1922–28, but a sharp rise in '22–'23, fall in '23–'24, rise in '24–'25 or '26, fall in '26–'27, and rise in '27–'28. In many industries such movements, of course, occurred. Granting the correctness of these observations, it still seems proper for the present purpose to regard 1922–28 as a unit. To find a satisfactory term to describe such a period is difficult; 'cyclical upswing' does not serve because the period contains parts of three cycles; years of '*generally* (although not consistently) sustained industrial expansion' seems fairly accurate, though cumbersome. Another expression, also imperfect, might be 'period between holocaustic depressions'. The problem of different 'wave-lengths' in cycle theory is, of course, one on which much work is now being done.

[3] In this chapter 'investment' is mainly used in the sense of capitalization. Similarly, 'rate of earnings' or 'earnings rate' means the percentage of total net income to capitalization and is employed as a briefer substitute for that expression.

the total number, show a rise in earnings rates. Thirty more, or about two-fifths of the total number, show scarcely any trends whatever. And in the 28 others, or the remaining two-fifths, definitely declining trends are shown. The term 'trend' is used loosely to denote the general slope of the curves in question—reference is not to computed, mathematically fitted curves. Nor is the term ever employed (unless specifically so stated) in the sense of long-time or secular trend; reference is only to the period under discussion. The footnotes of the next section explain this more fully.

These findings merit further analysis. How great were the increases in earnings rates in those industries which did record gains? How large were the losses in the group that actually showed declining trends? And what were the courses of sales and investment, in comparison with one another, and with earnings rates, in various industries?

2. INDUSTRIES WITH RISING EARNINGS RATES, 1922–1928

The 15 industries that enjoyed a general increase in their rates of return may be divided into two sets: those in which earnings rates, generally rising after 1922–23, reached their peaks in 1926; and those in which earnings rates reached their peaks in 1928.[4] Rates of earnings in the following industries reached their peaks in 1926 (or 1925):

[4] In all of the 'trends' now discussed either 1922 or 1923 (whichever is lower) is taken as the initial year from which the growth in the profits rates and the ranges of these rates over the period are determined. In a few cases the peaks in the one set of curves are reached in 1925; these are classified with the 1926 peak group. In a few cases also, when expansion continues beyond 1926, the peak is reached in 1927; these are classed with the 1928 peak group.

As previously stated, the word 'trend' is used loosely throughout this chapter, in the sense of general slope—not as a mathematical derivative. See footnote 6 for discussion of the determination of 'general slope'.

Meat Packing
Cleaning Preparations
Castings
Electrical Machinery
Miscellaneous Machinery

Similarly, earnings rates reached their peaks in 1928 (or 1927) in the following industries:

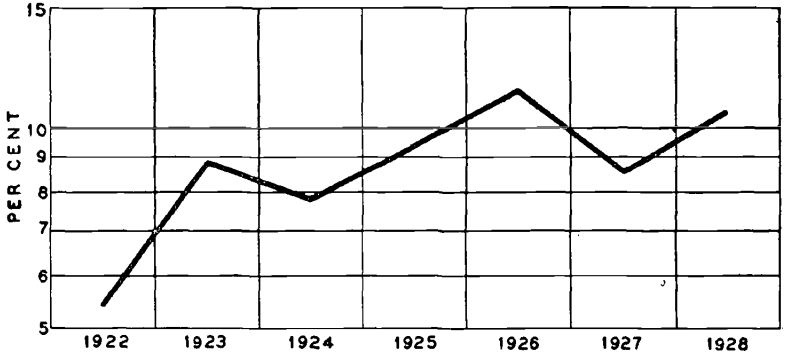
Beverages
Stationery
Crude Chemicals
Miscellaneous Chemicals
General Factory Machinery
Office Machinery
Firearms
Tools
Non-ferrous Metals
Miscellaneous Metals

Of course, were figures available for 1929 the dating of these peaks might be changed.

It will be noted that most of these industries showing increases are engaged in the manufacture of producers' rather than consumers' goods. The 15 industries combined show earnings of about 5 per cent in 1922, and of about 11 per cent in both 1926 and 1928, or approximately a doubling in the rate of return over the period. Chart 17

CHART 17

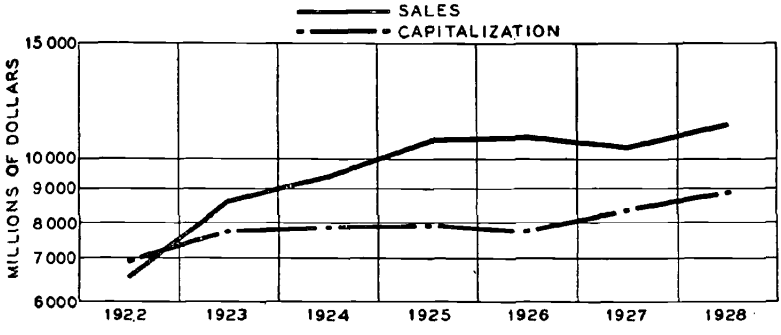
PERCENTAGE OF NET INCOME TO CAPITALIZATION
15 INDUSTRIES SHOWING INCREASING
EARNINGS RATES, 1922-28



presents the averages for the group. Sales in this group about doubled also, while capital investment rose about 23 per cent. These growths are observable in Chart 18. The

CHART 18

SALES AND CAPITALIZATION, 15 INDUSTRIES SHOWING INCREASING EARNINGS RATES, 1922-28



individual ranges for the period (high and low earnings years) for each industry are presented in Table 34.

TABLE 34

RANGES IN PERCENTAGES OF NET INCOME TO CAPITALIZATION, FOR 15 INDUSTRIES SHOWING INCREASING EARNINGS RATES, 1922–28

Industry	LOW *1922 (or 1923)* *(per cent)*	HIGH *1928 (or 1926)* *(per cent)*
Meat packing	2	6
Beverages	5	7
Stationery	4	10
Crude chemicals	9	11
Cleaning preparations	16	24
Miscellaneous chemicals	8	18
Castings and forgings	2	8
Electrical machinery	13	18
General factory machinery	7	13

TABLE 34 *(continued)*

RANGES IN PERCENTAGES OF NET INCOME TO CAPITALIZATION, FOR 15 INDUSTRIES SHOWING INCREASING EARNINGS RATES, 1922–28

Industry	LOW *1922 (or 1923) (per cent)*	HIGH *1928 (or 1926) (per cent)*
Office machinery	9	19
Firearms	10	19
Tools	8	15
Miscellaneous machinery	10	15
Non-ferrous metals	9	15
Miscellaneous metals	3	16

3. INDUSTRIES WITH FALLING EARNINGS RATES, 1922–28

The 28 industries in which earnings rates showed definitely declining trends are given below:

Dairy Products
Canned Foods
Cotton Converting
Weaving Woolens
Silk Weaving
Carpets
Knit Goods
Miscellaneous Textiles
Lumber Manufacturing
Planing Mills
Millwork
Furniture (non-metal)
Miscellaneous Lumber
Blank Paper
Miscellaneous Paper
Book and Music Publishing
Paints
Toilet Preparations
Ceramics
Glass
Portland Cement
Heating Machinery
Textile Machinery
Engines
Railroad Equipment
Hardware
Pianos
Miscellaneous Special Manufacturing Industries

It will be noted that no great preponderance of clearly definable producers' goods over consumers' goods industries is here apparent, at least not in sufficient measure to warrant any significant conclusions in this connection.

How great actually is the decline in earnings in these industries during 1922–28? The ranges for the individual industries vary greatly, as shown in Table 35; but the com-

TABLE 35

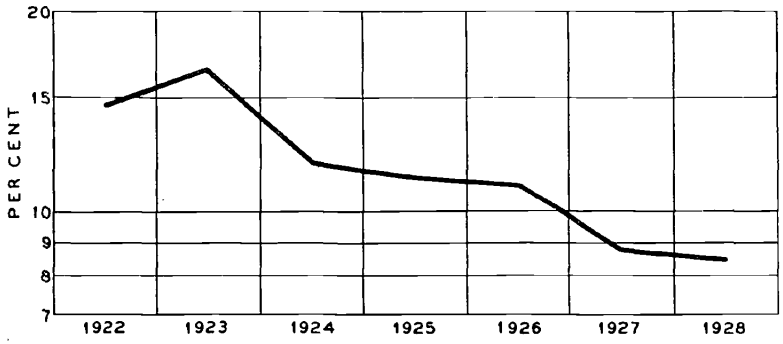
RANGES IN PERCENTAGES OF NET INCOME TO CAPITALIZATION, FOR 28 INDUSTRIES SHOWING DECLINING EARNINGS RATES, 1922–28

Industry	HIGH *1922 (or 1923) (per cent)*	LOW *1928 (or 1927) (per cent)*
Dairying	20	10
Canned goods	20	12
Cotton converting	15	8
Weaving woolens	15	1.5
Silk weaving	13	5
Carpets	35	6
Knit goods	25	10
Miscellaneous textiles	20	8
Lumber manufacture	25	7
Planing mills	26	7
Millwork	25	8
Furniture (non-metal)	19	10
Miscellaneous lumber	17	10
Blank paper	10	5
Miscellaneous paper	11	8
Book and music publishing	19	11
Paints	20	9
Toilet preparations	50	25
Ceramics	15	8
Glass	23	12
Portland cement	20	12
Heating machinery	21	9
Textile machinery	21	14
Engines	14	6
Railway equipment	13	3
Hardware	20	11
Pianos	12	5
Miscellaneous special manufacturing	20	12

bined figures for the group, as presented in Chart 19, evidence a drop of from 14.5 per cent in 1922 (and 16.4 per cent in 1923) to 8.5 per cent in 1928. Doubtless in several of these industries declining secular trends in the consumption of the product are one cause of the fall in the rate of return: in certain of them the volume of sales shows an absolute decrease. But in others sales show a substantial

CHART 19

PERCENTAGE OF NET INCOME TO CAPITALIZATION
28 INDUSTRIES SHOWING DECLINING
EARNINGS RATES, 1922-28



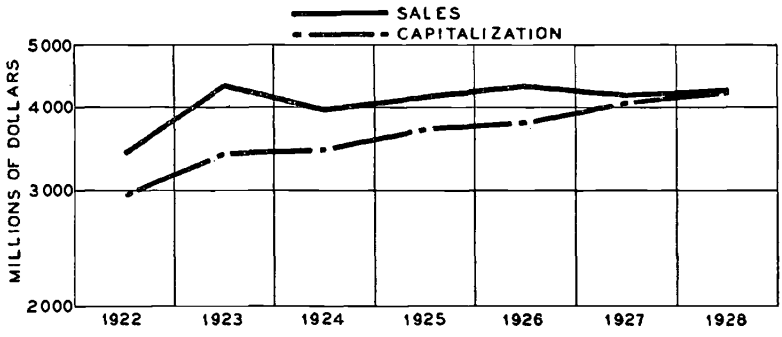
increase; here different factors primarily cause the relative profitableness to shrink. The word 'relative' is used advisedly, for the average (aggregate) return for this group in 1927 and 1928 still stood at about 9 per cent. Only 11 of the 28 industries, by 1928, fell to a point lower than that; and of these 11, only 4 fell below 6 per cent (Woolen Weaving, Silk Weaving, Blank Paper, Railway Equipment). Aggregate sales, for this declining profits trend group, remained virtually constant from 1923 through 1928; they are shown in Chart 20. Capital investment after 1923, however, increased steadily.

4. INDUSTRIES SHOWING NO TRENDS IN EARNINGS RATES

The final group, that of the 30 industries for which the rates of return either remained practically stable over the period or else showed such fluctuations that no trend could

CHART 20

SALES AND CAPITALIZATION, 28 INDUSTRIES SHOWING DECLINING EARNINGS RATES, 1922-28



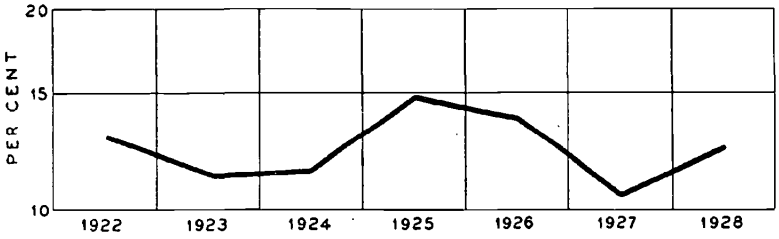
be detected,[5] earned from 12 to 13 per cent in both 1922

[5] In grouping the earnings ratio curves for these 73 industries a common sense interpretation in terms of reasonable approximation was used, rather than an abstract or refined mathematical technique. Some of the curves classified either as 'stable' or as 'no trends' showed small general increases over the period, but at best relatively slight ones; e.g., a change from a return of 11.3 per cent in 1922 to one of 12.2 per cent in 1928. This cannot be regarded, by anyone who possesses a sense of humor along with a slide-rule, as clearly constituting an increasing trend in the rate of net income for the period: there are altogether too many possible sources of error in the original data of individual companies, in the dropping of decimal points from the millions figures during the processes of computation, etc., to regard absolute variations of 1 per cent or less, in ratios such as these, as having any significance. When mere inspection of the curves (all were plotted on the same semi-logarithmic scales) failed to yield satisfactory knowledge as to the direction of the trend, then three-year moving averages were computed and their slopes over the period were allowed to influence the decision. In no instance were terminal values alone allowed to determine the classification; general slope or contour was always considered. One other factor was considered: where the slope established by inspection was so slight that a 1929 figure (which was not available) might readily have made questionable the direction of the trend—were it added to the series and did it chance to run counter to the 1922–28 result—then, too, the chart was placed in the 'no trend' group. (I.e., if the slope of the 1922–28 curve was downward, but so slightly that a *high* 1929 figure might readily have made the *1922–29* curve not clearly downward in general slope, then the chart was relegated to the no-trend category; if the 1922–28 curve showed

and 1928, although, as Chart 21 discloses, the curve fluc-

CHART 21

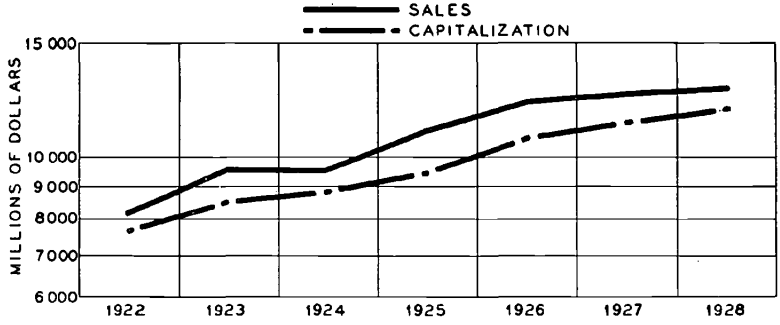
PERCENTAGE OF NET INCOME TO CAPITALIZATION
30 INDUSTRIES SHOWING NO TREND IN
EARNINGS RATES, 1922-28



tuated about this level during the period. Sales for this group, however, increased at about as rapid a rate as did those of the group in which earnings rates for the period increased. Chart 22 shows the steady upswing in sales and

CHART 22

SALES AND CAPITALIZATION, 30 INDUSTRIES
SHOWING NO TREND IN EARNINGS RATES, 1922-28



an upward slope, but a very *low* 1929 figure might have made the 1922–29 curve not clearly upward in general slope, then too the chart was cast aside.)

investment for this stationary or 'no trend' group, which includes several leading industries, among them Motor Vehicles, Rubber Goods, Petroleum Refining and Sheet Metal Products.

5. SUMMARY: RELATION OF SALES GROWTH TO INVESTMENT GROWTH

Net earnings rates did not, then, increase in most industries during the 1922–29 period. We may with assurance include 1929 in this statement, for while our data run only through 1928, the addition of the 1929 figures would not alter the direction of many of the trends that have been noted.[6] Earnings did, however, increase in absolute amount in slightly over one-half of the 73 branches of manufacture; and in their percentage upon capital investment in about one-fifth of the total number of manufacturing industries.

In most of the individual industries that exhibit *rising rates* of earnings in 1922–28, this rise does not seem to call forth additional capital investment at a rate more rapid than that of the increase in sales. But the case is different with certain of the industries that manifest *declining* earnings trends over the period of prosperity. Sales for the 28 industries of this group as a whole grew not at all from 1923 to 1928; but the aggregate investment and re-investment of capital in these industries increased steadily.[7]

[6] See note 5 preceding.

[7] That is, investment and re-investment by the corporations included in this series, which takes no account of new companies entering these industries or of old ones leaving during the period in question. In some instances, too, the effect of mergers is reflected, although presumably in the investment and sales figures alike. Despite these and other qualifications the fact that the corporations here included so expanded their capital investment in the face of the other trends mentioned is of significance. These trends, however, as will be suggested below, probably were unknown to those responsible for the expansion.

Circumstances in the following 13 of these 28 industries were responsible for this result:

Dairy Products	Glass
Knit Goods	Portland Cement
Miscellaneous Textiles	Textile Machinery
Miscellaneous Lumber	Engines
Miscellaneous Paper	Railroad Equipment
Book and Music Publishing	Pianos
Toilet Preparations	

These 13 groups will repay study. In each the rate of earnings declined. In some sales remained stationary, in some they declined, in some they grew. But in every instance additions to capital investment were made, either as sales declined or remained stationary, *at a faster rate* than sales increased.

It is no part of the present analysis to survey the detailed circumstances of each industry, although analyses by persons familiar with such details might yield explanations of the situation that do not appear on the surface. The aggregate situation, however, is shown in Charts 23 and 24. Between

CHART 23

PERCENTAGE OF NET INCOME TO CAPITALIZATION
13 INDUSTRIES IN WHICH CAPITALIZATION
GREW FASTER THAN SALES, 1922-28

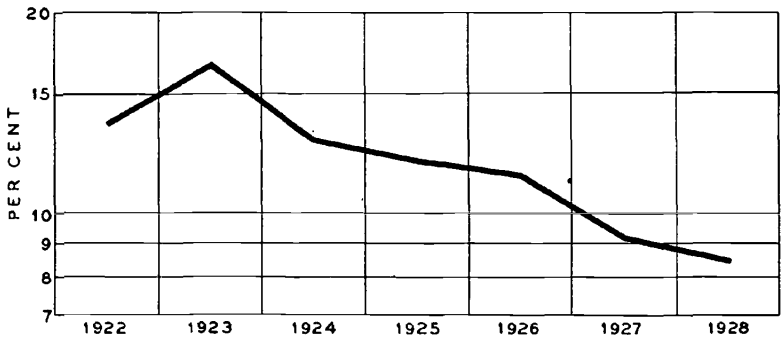
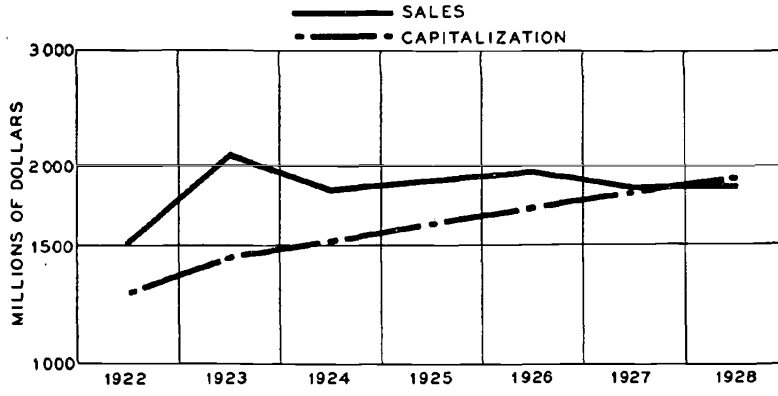


CHART 24

SALES AND CAPITALIZATION
13 INDUSTRIES IN WHICH CAPITALIZATION GREW FASTER THAN SALES, 1922-28



1923 and 1928 the aggregate sales of these 13 industries declined by 10 per cent. The rate of return fell from 16.7 to 8.5 per cent. Investment grew from nearly one and one-half billion dollars to almost two billion, the exact increase being 32 per cent.

This illustrates, it seems fair to remark, the failure of competition to function, as is often assumed, in directing the flow of productive resources between industries and groups. Seemingly, in no one of these 13 industries was the expansion of productive facilities called for; and in several, declining sales[8] indicated, or might have indicated, the wisdom of curtailing productive facilities. Yet these facts were either unknown to certain of the corporate entrepreneurs

[8] The effect of price changes is here ignored. Since over the period 1923–28 commodity prices were on the whole quite stable, we may assume, with mass data of this sort, that large changes in the dollar volume of sales indicate approximately equal changes in the physical volume of goods.

involved, or else they were not heeded. So long, apparently, as there is a substantial profit to be made, or the promise of one exists, the fact that a particular industry already has more than sufficient equipment to satisfy the demand for its products need make no difference to the individual business establishment. Even a generally declining trend of earnings may still yield an absolutely high return to the successful producer, especially if the rate is well above the cost of new capital,[9] and under these conditions, apparently, the industrial capacities of particular branches of manufacture are freely expanded.

In Charts 25 to 28, four examples of unwise industrial expansion are given; that is, presumably unwise in the light of subsequent maladjustments in production and employment in these industries as a whole. The expansion of any individual concern may or may not be wise for itself, of course, depending upon the given conditions in each case. But even additions to investment that result in profits to individual producers may cause losses and in some instances disaster for other producers, as well as for large numbers of workers employed in the industries. There are no accepted or standardized criteria for the wise and unwise investment of capital by individual producers in a competitive system. But in the absence of such criteria, a rate of investment expansion that clearly outstrips the rate of market expansion (as represented by the growth of sales) seems presumptive evidence of future economic difficulty, from the point of view of the industry as a whole.

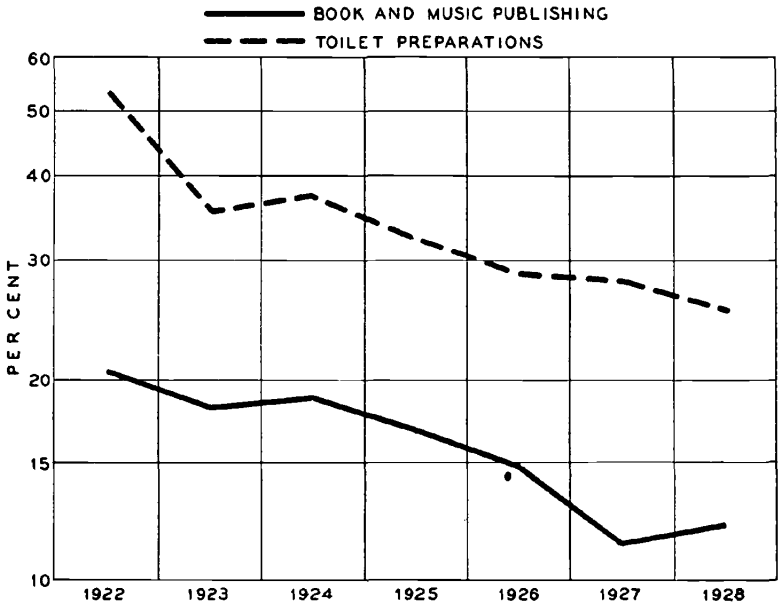
To the four examples of such expansion already cited—Book and Music Publishing, Toilet Preparations, Portland Cement, and Railway Equipment—we may now add a

[9] Either the direct expense of interest payments upon working or fixed capital, if it is borrowed, or the opportunity cost involved in investing one's own, or one's shareholders', capital.

fifth, one taken not from the declining earnings trend group but from the stationary or 'no-trend' group discussed earlier. This is Motor Vehicles. It is included with the other four

CHART 25

PERCENTAGE OF NET INCOME TO CAPITALIZATION IN TWO MINOR GROUPS, 1922-28



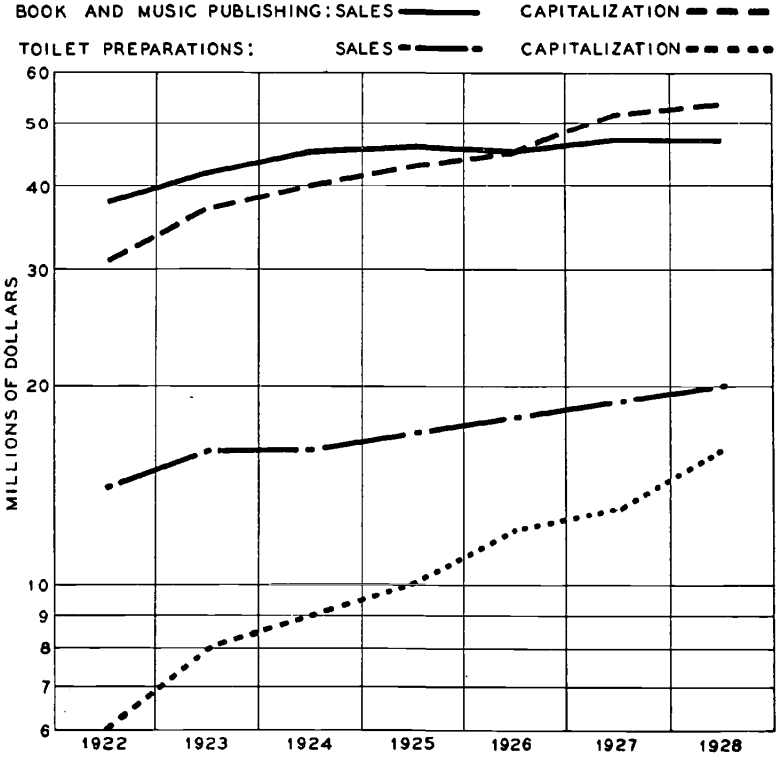
because while its rate of return from 1922 to 1928 did not decline sufficiently to place it in the group exhibiting definitely falling trends for that entire period, its earnings rates from 1925 onward manifest a clearly falling course: from 24 per cent in 1925 to 16 per cent in 1928.

Yet because either 24 or 16 per cent is more than a satisfactory return upon capital, and with a competitive situation under which no producer is restrained from expanding

his capacity, each felt that he had a better chance than his competitor to capture a larger portion of the market, and

CHART 26

SALES AND CAPITALIZATION
IN TWO MINOR GROUPS, 1922-28

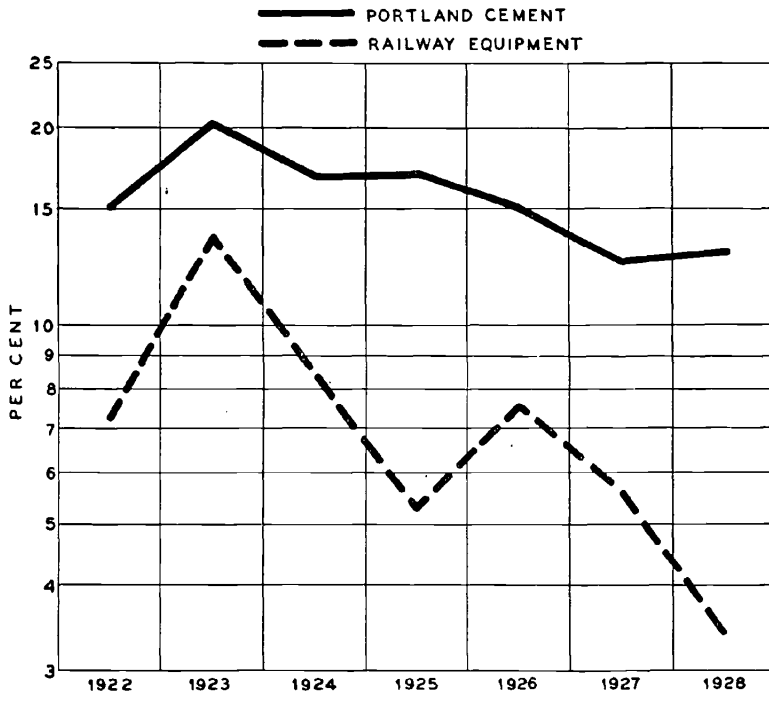


additions to plant capacity in Motor Vehicles continued to be made. Frequently, of course, the general trends of the earnings upon capital and the growth of aggregate investments are not really known to the business executive

concerned. And in some instances, further capital investment may be socially desirable in an industry yielding profits decidedly above the average even if the rate of profit is

CHART 27

PERCENTAGE OF NET INCOME TO CAPITALIZATION IN TWO MINOR GROUPS, 1922-28



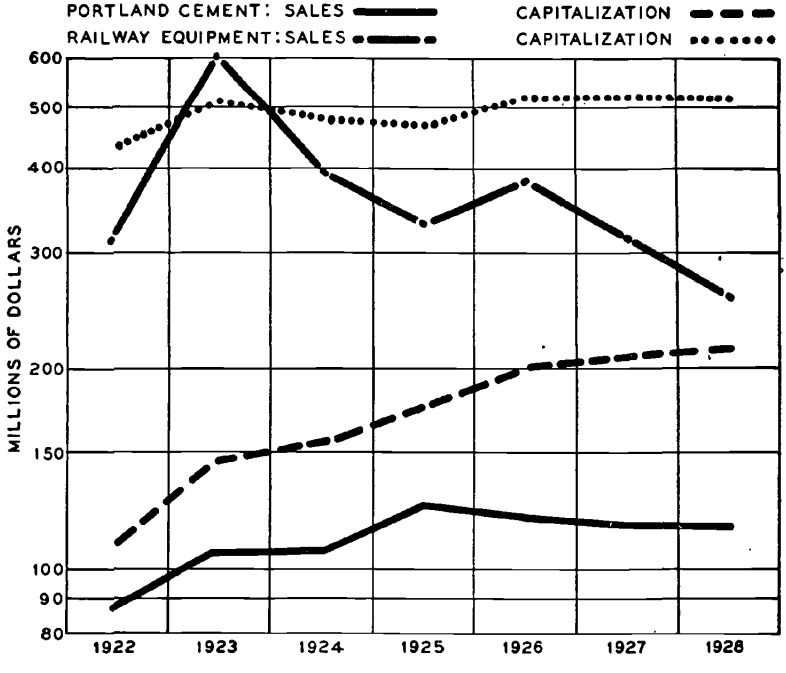
falling, but presumably only if sales are increasing more rapidly than productive capacity.

It is in this sense that the lure of profits over-rides the so-called law of supply and demand during a period of prosperity. Ultimately, a reckoning comes. But it comes

neither automatically nor quickly enough to prevent enormous investments of capital being made, over a period of six or eight years, in quarters where they are not really

CHART 28

SALES AND CAPITALIZATION
IN TWO MINOR GROUPS, 1922-28



needed and where they later serve to reduce profits below levels which, again under a competitive system, allow anything like the full employment of the capital so invested. It is, in other words, the possibility of absolutely high rates of income that causes overinvestment, relative to market needs, in *particular industries*. This overinvestment in pro-

ductive facilities for *particular* products, rather than increasing rates of earnings *in general,* is what later occasions difficulty so far as the profits situation is concerned. How, under a fully competitive system of industry, such investments can be checked, save by fuller disclosures and current publication of the figures and trends involved, it is difficult to see. On the other hand, our final chapter points out the statistical difficulties—to say nothing of the several political problems—connected with any plans for a centrally controlled economic system.

6. CONSUMERS' AND PRODUCERS' GOODS INDUSTRIES

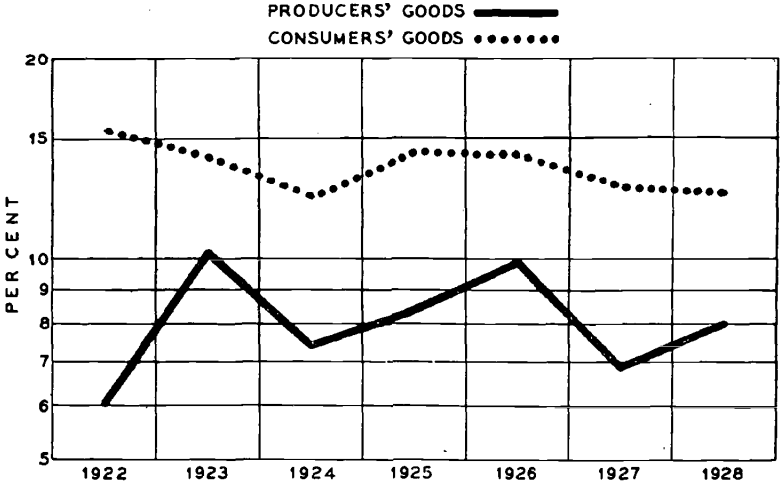
A final question relates to the situation of industries which make consumers' goods as compared with those which manufacture producers' goods. Since any classification of industries in this respect is somewhat difficult, the criterion employed is this: is the principal commodity made one eventually destined for human consumption in substantially the form in which it is produced, or is it simply a piece of equipment or a facilitating device of some sort in the production of other goods? Thus flour is regarded as an article destined for consumption; so also is cotton cloth. Castings and forgings on the whole are not; nor are most classes of machinery other than automobiles. Where, however, great doubt exists—where the products of an industry are used in large quantities both by producers and consumers, for example, Lumber, Electrical Machinery, Scientific Instruments —the industry is put into neither class but is omitted from the calculations.

Thus classed, the 18 industries manufacturing producers' goods show an aggregate earnings rate that runs from 6 per cent in 1922 to 10 per cent in both 1923 and 1926, and stands at 8 per cent in 1928. The group making consumers'

goods (26 industries) enjoys much higher and much steadier earnings—from 12 to 16 per cent in all years of the same period. The two curves are shown in Chart 29.

CHART 29

PERCENTAGE OF NET INCOME TO CAPITALIZATION
PRODUCERS' GOODS AND CONSUMERS' GOODS
INDUSTRIES, 1922-28



Sales in the consumers' goods group grew somewhat more rapidly than did capital investment (Chart 30). In the producers' goods, sales grew more rapidly from 1922 to 1926; thereafter, the growth of capital invested greatly exceeded that of sales (Chart 31). This relatively excessive investment of capital by producers' goods industries just prior to the peak of a cycle is a significant phenomenon. It accounts, for one thing, for the great distress of the 'heavy industries' in the ensuing period of depression. And it emphasizes the 'roundabout' character of modern methods

of production, under which enormous commitments of capital are regularly made solely *in anticipation* of a demand

CHART 30

SALES AND CAPITALIZATION
CONSUMERS' GOODS INDUSTRIES, 1922-28

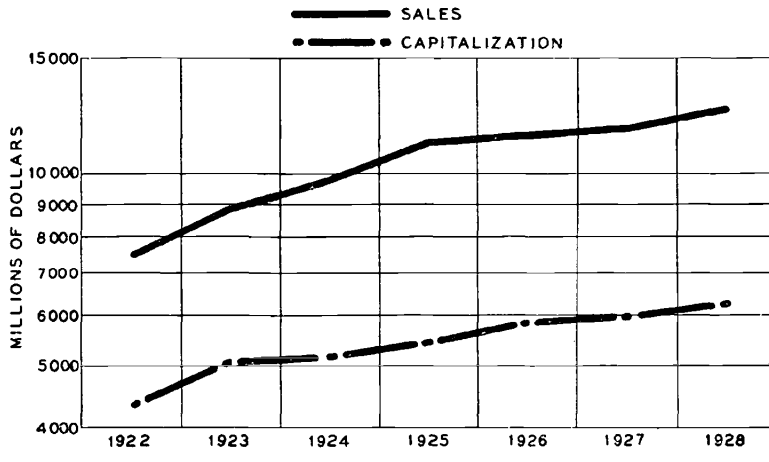
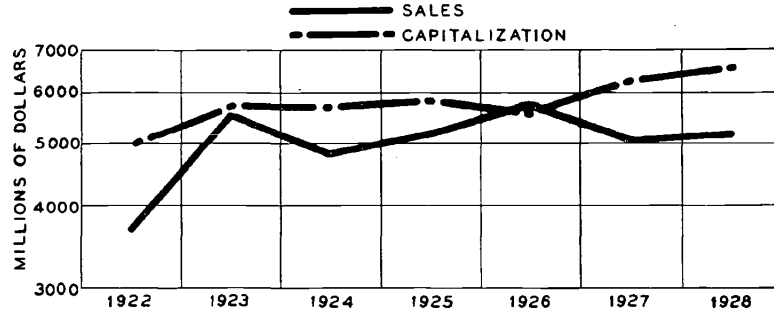


CHART 31

SALES AND CAPITALIZATION
PRODUCERS' GOODS INDUSTRIES, 1922-28



which, in either an absolute or a relative sense, is already declining even as the investments of capital made to satisfy it are increased.

The consumers' goods group, however, in which no such overinvestment—in the sense of a capital expansion altogether disproportionate to the growth of sales—took place towards the peak of the cycle, may be analyzed further. Producers' goods industries, after all, exist basically in order to feed or to maintain the industries that make consumers' goods; and the rates at which sales, profits and the like grow in various classes of consumers' goods industries are deserving of further attention.

The numerous consumers' goods industries for which aggregate data were just presented may arbitrarily be divided into three classes: those making goods that are quickly consumed; those making durable goods; and those making goods of intermediate durability. In the Quick consumption group have been placed all Food products, including Tobacco; Proprietary Preparations; Toilet Preparations. In the Intermediate consumption group have been placed all types of Clothing. Finally, in the Durable group have been put Furniture, non-metal; Motor Vehicles; Jewelry; Toys;[10] Pianos.

The volume of sales in each of these groups from 1922 through 1928 is shown in Chart 32. The annual sales of Durable goods more than doubled between 1922 and 1928, the degree of this increase greatly exceeding that of either of the other two types of commodity. Again, the growth in the capital investment devoted to the production of Durable

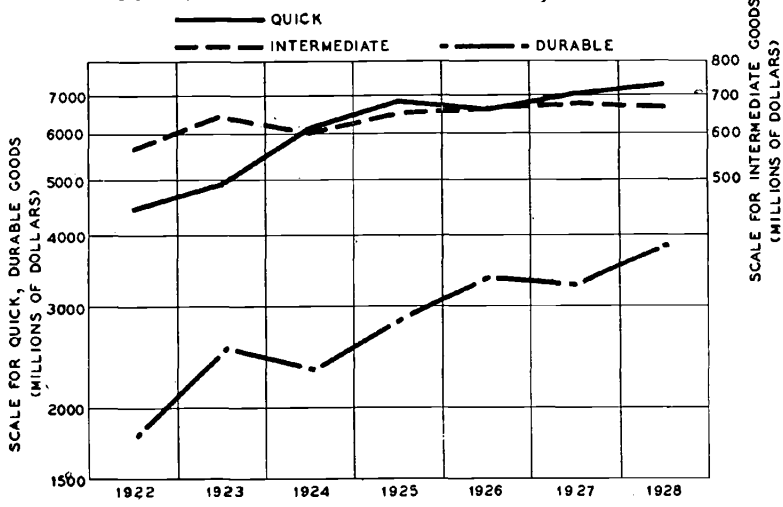
[10] One may question the inclusion of Toys in the Durable group; however, what is in mind is not the length of life, or the article's physical condition as it ages, so much as the greater or lesser degree of necessity for replacement as it becomes old. Most large toys, at least, are probably not articles for which the 'replacement' demand is elastic.

goods proceeded at a far more rapid rate than in the other two groups (Chart 33).

Finally, however, it is to be observed that the rate of

CHART 32

SALES IN 'QUICK', 'INTERMEDIATE' AND 'DURABLE' CONSUMPTION GOODS INDUSTRIES, 1922-28



earnings did not take the same course (Chart 34). In Durable goods, it fell; in Intermediate consumption goods, it fell too; in Quick consumption goods the rate showed a very slight increase. But even at the 1928 low point (of the period 1922–28), the return in Durable consumption goods stood higher than that in either of the other two groups. This illustrates again how falling earnings rates fail to check the investment of capital as long as their downward slope remains absolutely high—or at least high relative to other industries. In this instance, however, there is present no striking lack of proportion between the growth of sales and

the expansion of investment. The Durable consumption

CHART 33

CAPITALIZATION IN 'QUICK', 'INTERMEDIATE' AND 'DURABLE' CONSUMPTION GOODS INDUSTRIES, 1922-28

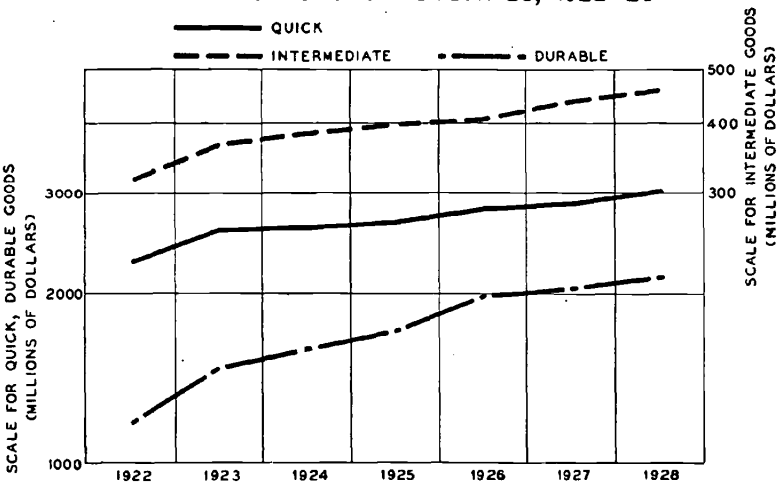
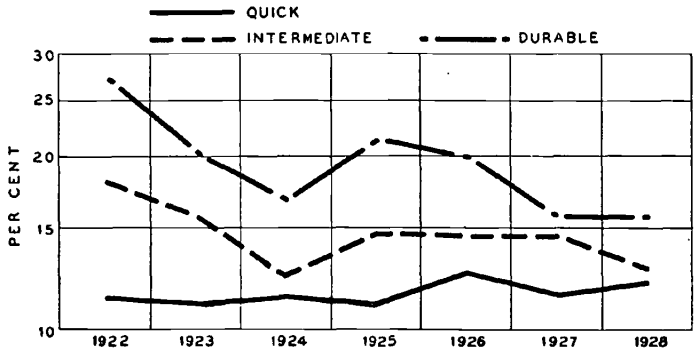


CHART 34

PERCENTAGE OF NET INCOME TO CAPITALIZATION IN 'QUICK', 'INTERMEDIATE' AND 'DURABLE' CONSUMPTION GOODS INDUSTRIES, 1922-28



goods industries merely became increasingly important in the national economy between 1922 and 1928. The increase that took place in their sales over this period, however, was greatly out of proportion to the growth of sales in other consumption goods industries and points to the relatively high state of 'consumers' inventories' that prevailed at the peak of prosperity and the beginning of depression.

7. INVESTMENT EXPANSION BY 71 COMPANIES, 1927–29

We may here return to the series of 71 manufacturing companies discussed in the preceding chapter, for which we have data running beyond 1928, and examine the capital assets of these corporations as shown by a set of condensed, composite balance sheets, in Table 36.

Between 1927 and 1929 both the aggregate fixed assets of these corporations and their combined capital stock and surplus increased about 18 per cent. Some part of this extraordinarily rapid increase is to be explained upon the basis of the merger of some of these companies with corporations not included in the list as of the end of 1927. But inquiry has disclosed that few of these corporations increased their assets by any very large relative amount for this reason. Lumping together the increases due to the effect of important mergers, the maximum net growth ascribable to this factor may roughly be estimated at 125 million dollars. This still leaves a net increase of 861 million dollars in the capital stock and surplus of these companies between 1927 and 1929, or a growth of approximately 15.9 per cent in these two years alone.

The bulk of this increase is found in the Chemical and Metals groups in which the gross increases in the capital stock and surplus items were 34 and 21 per cent. While data are not available for the sales of these groups in our

TABLE 36

CONDENSED COMPOSITE BALANCE SHEETS OF 71 COMPANIES IN ALL MAJOR MANUFACTURING GROUPS AS OF DECEMBER 31, 1927–30

	1927		*1928*		*1929*		*1930*	
Assets	*Millions of dollars*	*Percentage of total*	*Millions of dollars*	*Percentage of total*	*Millions of dollars*	*Percentage of total*	*Millions of dollars*	*Percentage of total*
Cash and equivalent	1185	17.1	1255	17.3	1269	15.9	1289	16.5
Inventories	1338	19.2	1424	19.6	1512	19.0	1395	17.8
Other current assets	543	7.8	576	7.9	600	7.5	544	7.0
Total current assets	3066	44.1	3255	44.8	3381	42.4	3228	41.3
Fixed assets	3879	55.9	4010	55.2	4596	57.6	4586	58.7
Total assets	6945	100.0	7265	100.0	7977	100.0	7814	100.0
Liabilities								
Total current liabilities	610	8.8	694	9.6	677	8.5	459	5.9
Funded debt	722	10.4	715	9.8	656	8.2	696	8.9
Capital stock and surplus	5416	78.0	5655	77.8	6402	80.3	6494	83.1
Other liabilities	197	2.8	201	2.8	242	3.0	165	2.1
Total liabilities	6945	100.0	7265	100.0	7977	100.0	7814	100.0

71 companies series, we may note that in our larger samples (which include the corporations of the 71 companies series) sales in the Chemical group fell off substantially between 1927 and 1928 and in the Metals group showed only an 11 per cent increase. Sales data for 1929 are not available for either series, but it seems fairly certain that whatever increase occurred between 1927 and 1929 was not nearly so great as the increases in investment just noted.

NOTE UPON

ABSOLUTE SALES AND INCOME CHANGES

DECLINE IN SALES, 1920–1921

IN THIS and the preceding chapter, interest was centered chiefly upon the general course of sales, income and investment in different industries over the period 1922–28. This note summarizes an examination of some shorter-run phenomena: the decline of sales and income, in each industry, from the cyclical peak to the trough which, within a year or two, follows; and the recovery from the bottom of the trough to the immediately succeeding point of recovery. Which industries suffer the severest, which the mildest, drops? Which soon recover to a greater, which to a lesser extent? How does a decline in sales affect the amount of net income in one industry as compared with another? The discussion is couched in terms of *absolute amounts* of income and sales and their relative changes—not *rates* of return upon either sales or investment. For, over so short a period as from one year to the next, it may be assumed that investment does not ordinarily vary sufficiently to make adjustments in the data essential. By and large, the typical manufacturing plant or retail store possessed roughly the same total capital or capitalization at the beginning of 1920 as a year later in 1921; it is thus roughly accurate to compare the sales made or incomes received during 1920 with those of 1921. The procedure, then, is to measure the percentage by which actual sales in a prosperous year such as 1920 are 'off' in a depression year such as 1921; and similarly to compare the actual amounts of net income earned, or lost in such years. The cycles through which all, or nearly all, individual industries pass, however, are not exactly the same. While most of our 73 manufacturing minor groups have sales peaks in 1920, some show peaks in 1919. In such cases, 1921 is com-

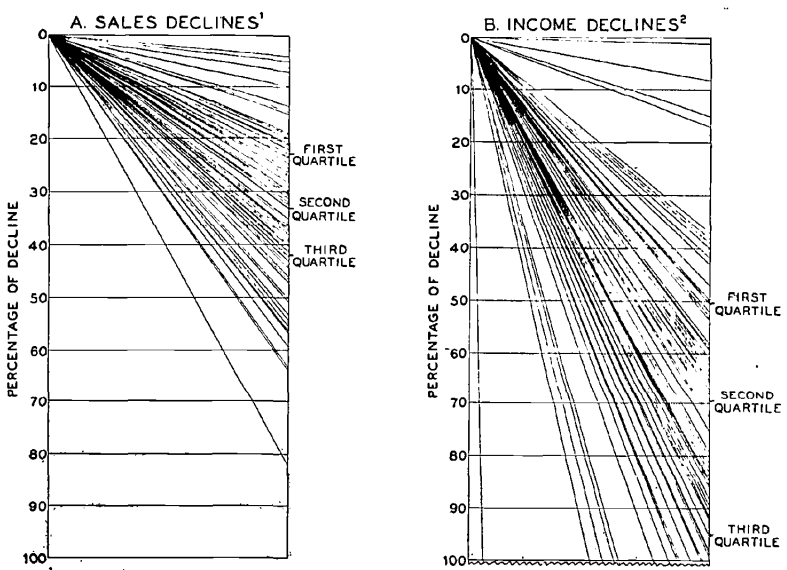
pared not with 1920 but with 1919. This is also, of course, true of the volume of income; and there the same procedure is followed.[1]

Examining the contraction in sales volume that took place in the 73 manufacturing industries from 1920 (or 1919) to 1921, we find a wide variation in the percentages of decline. Two industries show not declines but increases; in 16 others the declines range from 4 to 25 per cent, while 44 more suffer declines of from 25 to 50 per cent. In the remaining 11 groups, decreases of from 50 to 82 per cent occurred. The quartiles are shown in Chart 35.

CHART 35

DISPERSION OF PERCENTAGE DECLINES IN SALES AND INCOME IN 73 MANUFACTURING INDUSTRIES, 1921 COMPARED WITH 1920 (OR 1919)

(WITH QUARTILES OF THE DISTRIBUTION INDICATED)



[1] TWO INDUSTRIES WHICH SHOWED INCREASES ARE OMITTED.
[2] THREE INDUSTRIES WHICH SHOWED INCREASES ARE OMITTED.

[1] In the case of net income, in certain instances when the peak occurs in 1919, the low point is reached in 1920 and recovery is evidenced in 1921. In such instances the 1920 low is the figure that is compared with the peak. Appendix Table 6 gives the absolute data, which may be consulted or charted by the reader who cares to extend the analysis.

DECLINE IN NET INCOMES, 1920–21

The same procedure may be followed in analyzing the amounts of net incomes received by the 73 manufacturing groups in 1920 and 1921. Of the 73 industries 3 showed increases in income and 4 had declines of less than 25 per cent. Eight industries underwent declines of from 25 to 50 per cent, while 58 industries suffered declines of 50 per cent or over. Of these, 44 showed income shrinkages of from 50 to 100 per cent, while 14 declined over 100 per cent, that is, they had deficits in 1921.

COMPARISON, 1921 SALES AND INCOME DECLINES

The fact that sales declined by 50 per cent or more in only 11 of the 73 industries, while income fell by 50 per cent or over in 58, vividly corroborates the oft-repeated statement that a "small drop in gross revenues may cause a large drop in net". In all 73 manufacturing groups combined, sales fell, roughly 33 per cent between 1920 and 1921, from 25 billion dollars to 16 billion. But total net income fell 75 per cent from exactly two billion to almost precisely one-half billion. This, of course, is because overhead expense remains relatively constant over short periods, or at least seldom contracts in proportion to the reduction in sales. The discrepancy is emphasized graphically in Chart 35. The two sections of the chart are drawn to the same scale, but in the income diagram the available space prevents carrying down fully the lines representing drops of over 100 per cent.

Although certain industries are conspicuous in the degree to which given declines in sales cause disproportionate shrinkages in net earnings, there is nevertheless a fairly close general correspondence between the relative standing of the different industries with respect to their declines in sales and in income.[2] If we compare specifically the list of the ten industries showing the smallest declines in sales from 1920 to 1921 with that of the ten showing the slightest falling off in incomes, we find that seven industries are common to both lists.

Similarly, if we compare the industries that suffer the largest sales

[2] Only the industries occupying extreme positions are analyzed here, but a general measurement of the correlation in ranks is undertaken later.

declines with those undergoing the greatest income curtailment, we find a high degree of correspondence in the two lists. Here, however, the industries with the greatest declines in incomes suffered actual deficits—13 industries in all. Comparing with this list, then, not the 10 but the 13 industries in which sales declined the most, we find 10 names common to both lists.

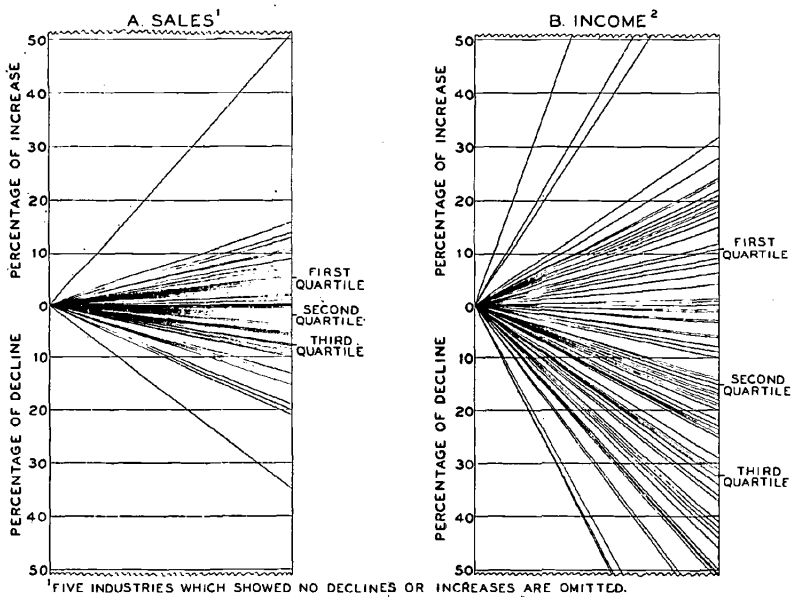
SALES AND INCOME DECLINES, 1923–1924

The year 1924, while not nearly so depressed as 1921, recorded a general drop in business activity. The *Annalist* index fell from 108 in 1923 to 97 in 1924 and the index of the American Telephone

CHART 36

DISPERSION OF PERCENTAGE DECLINES OR INCREASES IN SALES AND INCOME IN 73 MANUFACTURING INDUSTRIES, 1924 COMPARED WITH 1923

(WITH QUARTILES OF THE DISTRIBUTION INDICATED)



[1]FIVE INDUSTRIES WHICH SHOWED NO DECLINES OR INCREASES ARE OMITTED.

[2]ONE INDUSTRY WHICH SHOWED NO DECLINE OR INCREASE IS OMITTED.

and Telegraph Company from 108 to 95.[8] The 1921 figures for the two indexes respectively were 85 and 76. Although annual figures by no means indicate the full extent of the drop, it is nevertheless of interest to examine the 1923–24 recessions in sales and income in the 73 manufacturing industries and to compare them with the 1920–21 situation. Nearly half of these industries showed no sales declines at all in 1924 (more accurately, 32 failed to show declines). Rather, in 27, sales increased. In 5 others, sales equalled the 1923 figures. Only in the remaining 41 minor groups did sales fall off. More than ever, one is impressed with the fact that what we term 'general business' (however useful a concept) is a composite, an abstraction.

The 1923–24 declines in the 41 manufacturing groups where sales fell off are not large as compared with the declines of 1920–21. In 28 groups they are less than 10 per cent; in 9 more they run from 10 to 15 per cent; in only 4 groups are they 20 per cent or more.

Net income, 1923–24, either remains constant or increases in about one-third of the 73 industries. Of these 25 groups, one shows the same income in 1924 as in 1923, while the other 24 all register gains ranging from 3 to more than 100 per cent. In the 48 groups that show declines in income, the drops range from 1 to 89 per cent.

SALES AND INCOME DECLINES, 1926–1927

The year 1927 is customarily regarded as one of mildest recession. While the general drop of that year was hardly felt in comparison with either that of 1921 or even 1924, data for the rate of net earnings upon capital presented in Chapters 6 and 7 have suggested that 1927 recorded a more severe business contraction than is ordinarily thought to have been the case. A survey of the absolute declines in sales and income, 1926–27, seemingly corroborates this earlier conclusion, although again annual figures do not tell the entire story. Of the 73 manufacturing industries, 39 show declines in sales. Most of the declines are of almost the same magnitude as the declines shown by the 1923–24 list. In 1924, 28 groups showed declines ranging from 1 to 10 per cent; in 1927, 31 groups fell into the same category.

In 1924, 13 groups showed declines of 10 per cent or over, while in 1927, 8 groups did so.

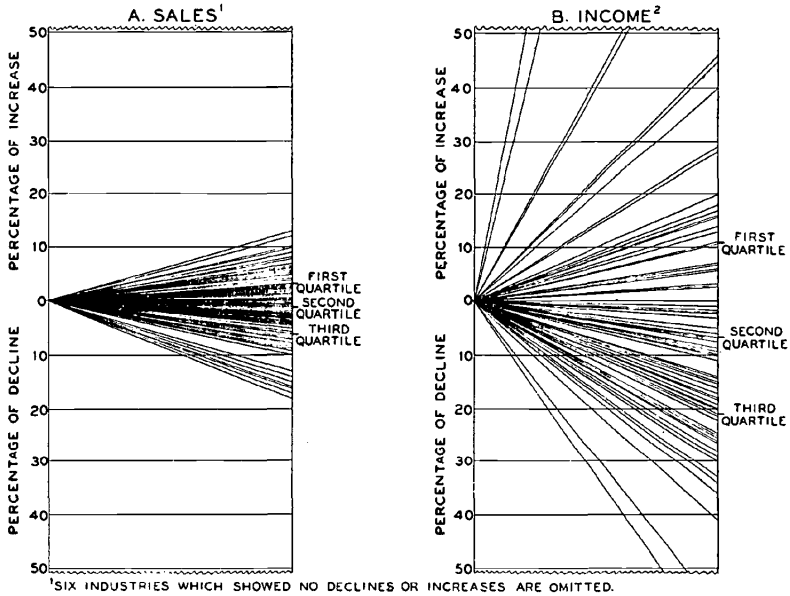
[8] These figures are annual averages of the monthly data.

As regards net income, the number of groups showing declines in 1927 is almost the same as that for 1923–24, 47 in one case and 48 in the other. The range is not greatly different, although a smaller proportion of industries suffers extreme changes: in 1927, 3 groups show income drops of 50 per cent or over, as against 8 groups in 1924.

CHART 37

DISPERSION OF PERCENTAGE DECLINES OR INCREASES IN SALES AND INCOME IN 73 MANUFACTURING INDUSTRIES, 1927 COMPARED WITH 1926

(WITH QUARTILES OF THE DISTRIBUTION INDICATED)



[1]SIX INDUSTRIES WHICH SHOWED NO DECLINES OR INCREASES ARE OMITTED.

[2]ONE INDUSTRY WHICH SHOWED NO DECLINE OR INCREASE IS OMITTED.

INCREASES IN SALES AND INCOME, 1921–22

We may now inquire how the rate of recovery in sales and incomes varied.

The 1922 upswing in sales ranges from 1 to 82 per cent over the

1921 figures.[4] In 15 industries the gains were under 10 per cent; in 25, from 10 to 19 per cent; in 30, from 20 to 49 per cent; in 3, 50 per cent or over.

Increases in net income, 1921–22, range from 6 to several hundred and even more than a thousand per cent; in some of the industries, however, actual deficits prevailed in 1921. Fifty-eight show gains of 50 per cent or over; 44, of 100 per cent or over.

GENERAL RELATIONSHIPS BETWEEN INCOME AND SALES CHANGES

Thus far, this note has dealt broadly with the character of the variation in income and sales changes. There remain to be given certain measurements of the general degree to which decreases and increases in income and sales correspond.

a. High Correspondence in Sales and Income Declines

If the 73 industries be arrayed (or ranked) according to their percentages of sales decline, and then, in parallel columns, are entered their positions in terms of their income declines, we obtain the two lists presented in Table 37. The general correspondence in ranks prevailing between these two lists is close, about 70 per cent perfect.

TABLE 37

RANK OF 73 MANUFACTURING GROUPS IN SALES DECLINE COMPARED WITH RANK IN INCOME DECLINE, 1920–21

MINOR GROUP	RANK IN SALES DECLINE	RANK IN INCOME DECLINE
26 Planing mills	1	45
65 Tools	2	10
66 Bolts and nuts	3	12
12 Cotton spinning	4	39
50 Sheet metal	5	2
70 Miscellaneous metals	6	8
23 Miscellaneous leather	7	4
31 Cardboard boxes	8	17
51 Wire and nails	9	14
11 Miscellaneous foods	10	6

[4] In 10 industries out of the 73, the increases are for 1923 over 1922, the latter year being in those 10 industries lower than 1921. In 3 other industries, the comparison is also that of 1923 over 1922 because the latter is as low as 1921.

TABLE 37 *(continued)*

RANK OF 73 MANUFACTURING GROUPS IN SALES DECLINE

MINOR GROUP		RANK IN SALES DECLINE	RANK IN INCOME DECLINE
49	Castings and forgings	11	13
32	Stationery	12	9
24	Rubber products	13	3
68	Non-ferrous metals	14	28
4	Package foods	15	7
61	Railway equipment	16	38
48	Miscellaneous clay and stone products	17	21
38	Crude chemicals	18	57
25	Lumber manufacture	19	25
63	Firearms	20	31
27	Millwork	21	23
58	Mining machinery	22	26
67	Miscellaneous machinery	23	11
14	Cotton weaving	24	40
30	Blank paper	25	15
64	Hardware	26	22
69	Jewelry	27	19
7	Meat packing	28	1
33	Miscellaneous paper	29	33
62	Motor vehicles	30	36
44	Miscellaneous chemicals	31	53
21	Miscellaneous textiles	32	49
46	Glass	33	42
52	Heating machinery	34	37
3	Confectionery	35	32
13	Cotton converting	36	24
57	Engines	37	55
29	Miscellaneous lumber	38	56
39	Paints	39	34
2	Flour	40	27
6	Canned goods	41	44
20	Miscellaneous clothing	42	29
45	Ceramics	43	54
59	General factory machinery	44	35
72	Toys	45	65
37	Miscellaneous printing and publishing	46	63
18	Men's clothing	47	41
19	Knit goods	48	51
73	Pianos	49	30
28	Furniture (non-metal)	50	47
40	Petroleum refining	51	20
16	Silk weaving	52	18

TABLE 37 *(continued)*

RANK OF 73 MANUFACTURING GROUPS IN SALES DECLINE

MINOR GROUP		RANK IN SALES DECLINE	RANK IN INCOME DECLINE
17	Carpets	53	61
53	Electrical machinery	54	48
55	Printing machinery	55	64
36	Job printing	56	62
43	Cleaning preparations	57	5
60	Office machinery	58	43
1	Bakery products	59	72
56	Road machinery	60	50
71	Scientific instruments	61	58
41	Proprietary preparations	62	59
15	Weaving woolens	63	16
74	Miscellaneous special manufacturing	64	60
5	Dairying	65	46
22	Boots and shoes	66	52
54	Textile machinery	67	67
47	Portland cement	68	69
34	Newspapers	69	68
35	Book and music publishing	70	70
10	Tobacco	71	71
9	Beverages	72	73
42	Toilet preparations	73	66

Coefficient of rank correlation +0.71

That is to say, the coefficient of rank correlation is +0.71, on a scale in which 1.00 would express perfect correspondence of positions. With due allowance for individual exceptions, we may therefore say that in general the industries that show the larger *sales declines* are also those which show the greater *net income declines.*

b. Lack of Correspondence in Sales and Income Increases

Similarly arraying the 1921–22 percentages of sales and income increase, we obtain the lists given in Table 38. The general correspondence in ranks is very slight and does not justify a conclusion similar to that concerning the two sets of decreases previously discussed. On the whole, it cannot be said that the industries which enjoy the larger *increases* in sales in the year of recovery following one of severe depression are those which also show the greater increases in net income. The coefficient of rank correlation here is only

+0.13, expressing little more than a chance relationship between the two sets of ranks.

TABLE 38

RANK OF 73 MANUFACTURING GROUPS IN SALES INCREASE COMPARED WITH RANK IN INCOME INCREASE, 1921–22

MINOR GROUP		RANK IN SALES INCREASE	RANK IN INCOME INCREASE
66	Bolts and nuts	1	4
50	Sheet metal	2	35
57	Engines	3	71
65	Tools	4	17
29	Miscellaneous lumber	5	39
12	Cotton spinning	6	63
17	Carpets	7	61
56	Road machinery	8	55
25	Lumber manufacture	9	19
62	Motor vehicles	10	27
26	Planing mills	11	32
27	Millwork	12	7
53	Electrical machinery	13	47
58	Mining machinery	14	22
64	Hardware	15	8
68	Non-ferrous metals	16	16
51	Wire and nails	17	2
48	Miscellaneous clay and stone products	18	5
45	Ceramics	19	50
19	Knit goods	20	67
21	Miscellaneous textiles	21	73
31	Cardboard boxes	22	3
63	Firearms	23	15
38	Crude chemicals	24	31
39	Paints	25	21
47	Portland cement	26	48
52	Heating machinery	27	33
59	General factory machinery	28	45
9	Beverages	29	26
23	Miscellaneous leather	30	25
28	Furniture (non-metal)	31	38
72	Toys	32	64
73	Pianos	33	14
49	Castings and forgings	34	6
6	Canned goods	35	42
46	Glass	36	51
5	Dairying	37	62
18	Men's clothing	38	54

TABLE 38 *(continued)*

RANK OF 73 MANUFACTURING GROUPS IN SALES INCREASE

MINOR GROUP		RANK IN SALES INCREASE	RANK IN INCOME INCREASE
24	Rubber products	39	41
33	Miscellaneous paper	40	44
70	Miscellaneous metals	41	30
69	Jewelry	42	11
3	Confectionery	43	37
13	Cotton converting	44	29
44	Miscellaneous chemicals	45	56
15	Weaving woolens	46	1
55	Printing machinery	47	59
71	Scientific instruments	48	36
42	Toilet preparations	49	52
1	Bakery products	50	65
14	Cotton weaving	51	66
22	Boots and shoes	52	46
32	Stationery	53	18
41	Proprietary preparations	54	43
11	Miscellaneous foods	55	23
61	Railway equipment	56	60
7	Meat packing	57	40
34	Newspapers	58	53
36	Job printing	59	69
60	Office machinery	60	58
67	Miscellaneous machinery	61	13
37	Miscellaneous printing and publishing	62	72
54	Textile machinery	63	68
74	Miscellaneous special manufacturing	64	49
4	Package foods	65	10
20	Miscellaneous clothing	66	20
35	Book and music publishing	67	57
10	Tobacco	68	70
16	Silk weaving	69	12
30	Blank paper	70	28
43	Cleaning preparations	71	24
2	Flour	72	34
40	Petroleum refining	73	9

Coefficient of rank correlation +0.13

c. Correspondence in Sales Declines and Sales Increases

We now may, in the same way, ask whether the industries that experienced the greater *sales declines* in 1921 were those which enjoyed the larger *sales increases* in 1922. The two lists of ranks are

TABLE 39

RANK OF 73 MANUFACTURING GROUPS IN SALES DECLINE, 1920–21, COMPARED WITH RANK IN SALES INCREASE, 1921–22

MINOR GROUP		RANK IN SALES DECLINE	RANK IN SALES INCREASE
26	Planing mills	1	11
65	Tools	2	4
66	Bolts and nuts	3	1
12	Cotton spinning	4	6
50	Sheet metal	5	2
70	Miscellaneous metals	6	41
23	Miscellaneous leather	7	30
31	Cardboard boxes	8	22
51	Wire and nails	9	17
11	Miscellaneous foods	10	55
49	Castings and forgings	11	34
32	Stationery	12	53
24	Rubber products	13	39
68	Non-ferrous metals	14	16
4	Package foods	15	65
61	Railway equipment	16	56
48	Miscellaneous clay and stone products	17	18
38	Crude chemicals	18	24
25	Lumber manufacture	19	9
63	Firearms	20	23
27	Millwork	21	12
58	Mining machinery	22	14
67	Miscellaneous machinery	23	61
14	Cotton weaving	24	51
30	Blank paper	25	70
64	Hardware	26	15
69	Jewelry	27	42
7	Meat packing	28	57
33	Miscellaneous paper	29	40
62	Motor vehicles	30	10
44	Miscellaneous chemicals	31	45
21	Miscellaneous textiles	32	21
46	Glass	33	36
52	Heating machinery	34	27
3	Confectionery	35	43
13	Cotton converting	36	44
57	Engines	37	3
29	Miscellaneous lumber	38	5
39	Paints	39	25
2	Flour	40	72
6	Canned goods	41	35
20	Miscellaneous clothing	42	66

TABLE 39 *(continued)*

RANK OF 73 MANUFACTURING GROUPS IN SALES DECLINE

MINOR GROUP		RANK IN SALES DECLINE	RANK IN SALES INCREASE
45	Ceramics	43	19
59	General factory machinery	44	28
72	Toys	45	32
37	Miscellaneous printing and publishing	46	62
18	Men's clothing	47	38
19	Knit goods	48	20
73	Pianos	49	33
28	Furniture (non-metal)	50	31
40	Petroleum refining	51	73
16	Silk weaving	52	69
17	Carpets	53	7
53	Electrical machinery	54	13
55	Printing machinery	55	47
36	Job printing	56	59
43	Cleaning preparations	57	71
60	Office machinery	58	60
1	Bakery products	59	50
56	Road machinery	60	8
71	Scientific instruments	61	48
41	Proprietary preparations	62	54
15	Weaving woolens	63	46
74	Miscellaneous special manufacturing	64	64
5	Dairying	65	37
22	Boots and shoes	66	52
54	Textile machinery	67	63
47	Portland Cement	68	26
34	Newspapers	69	58
35	Book and music publishing	70	67
10	Tobacco	71	68
9	Beverages	72	29
42	Toilet preparations	73	49

Coefficient of rank correlation +0.41

given in Table 39. The correspondence is only about 40 per cent perfect, the coefficient of rank correlation being +0.41.

d. High Correspondence in Income Declines and Increases

Finally, and in like manner, we ask whether the industries in which income *declined* most, 1920–21, are in general the industries in which it *increased* most, 1921–22. The correspondence here is high—over 70 per cent perfect. The two sets of ranks are shown in

TABLE 40

RANK OF 73 MANUFACTURING GROUPS IN INCOME DECLINE, 1920–21, COMPARED WITH RANK IN INCOME INCREASE, 1921–22

MINOR GROUP		RANK IN INCOME DECLINE	RANK IN INCOME INCREASE
7	Meat packing	1	40
50	Sheet metal	2	35
24	Rubber products	3	41
23	Miscellaneous leather	4	25
43	Cleaning preparations	5	24
11	Miscellaneous foods	6	23
4	Package foods	7	10
70	Miscellaneous metals	8	30
32	Stationery	9	18
65	Tools	10	17
67	Miscellaneous machinery	11	13
66	Bolts and nuts	12	4
49	Castings and forgings	13	6
51	Wire and nails	14	2
30	Blank paper	15	28
15	Weaving woolens	16	1
31	Cardboard boxes	17	3
16	Silk weaving	18	12
69	Jewelry	19	11
40	Petroleum refining	20	9
48	Miscellaneous clay and stone products	21	5
64	Hardware	22	8
27	Millwork	23	7
13	Cotton converting	24	29
25	Lumber manufacture	25	19
58	Mining machinery	26	22
2	Flour	27	34
68	Non-ferrous metals	28	16
20	Miscellaneous clothing	29	20
73	Pianos	30	14
63	Firearms	31	15
3	Confectionery	32	37
33	Miscellaneous paper	33	44
39	Paints	34	21
59	General factory machinery	35	45
62	Motor vehicles	36	27
52	Heating machinery	37	33
61	Railway equipment	38	60
12	Cotton spinning	39	63
14	Cotton weaving	40	66
18	Men's clothing	41	54
46	Glass	42	51

TABLE 40 *(continued)*

RANK OF 73 MANUFACTURING GROUPS IN INCOME DECLINE

MINOR GROUP		RANK IN INCOME DECLINE	RANK IN INCOME INCREASE
60	Office machinery	43	58
6	Canned goods	44	42
26	Planing mills	45	32
5	Dairying	46	62
28	Furniture (non-metal)	47	38
53	Electrical machinery	48	47
21	Miscellaneous textiles	49	73
56	Road machinery	50	55
19	Knit goods	51	67
22	Boots and shoes	52	46
44	Miscellaneous chemicals	53	56
45	Ceramics	54	50
57	Engines	55	71
29	Miscellaneous lumber	56	39
38	Crude chemicals	57	31
71	Scientific instruments	58	36
41	Proprietary preparations	59	43
74	Miscellaneous special manufacturing	60	49
17	Carpets	61	61
36	Job printing	62	69
37	Miscellaneous printing and publishing	63	72
55	Printing machinery	64	59
72	Toys	65	64
42	Toilet preparations	66	52
54	Textile machinery	67	68
34	Newspapers	68	53
47	Portland cement	69	48
35	Book and music publishing	70	57
10	Tobacco	71	70
1	Bakery products	72	65
9	Beverages	73	26

Coefficient of rank correlation +0.72

Table 40, the coefficient of rank correlation being +0.72. This correspondence between the ranks in income declines and increases is just about the same as that found in a preceding section for sales declines and income declines, and justifies the statement that, on the whole, the manufacturing groups that suffer the severest curtailment of income in depression enjoy the greatest relative enhancement of income upon the return of prosperity. At least, this was the case in

the period 1920–22. Whether the generalization holds, in the same strong measure, for all periods of decline, depression and revival cannot, of course, be said; but one is inclined to suspect that some substantial degree of positive correlation, at least, in this respect prevails for other periods as well.

Finally by way of summary it may be of interest to have a more refined and yet not too abstract measure of the extent to which sales and income declines are correlated than that afforded by the coefficient of rank correlation and the other devices employed in the preceding sections. It has been pointed out that because of the presence of either fixed or relatively fixed overhead costs in nearly all manufacturing industries, a comparatively small drop in gross revenues will cause a large shrinkage in net earnings. It was also shown graphically that the general dispersion in net income declines, 1920–21, was far greater than that in sales declines. We did not, however, undertake to measure the varying degrees to which declines of a given magnitude in the one factor were accompanied by proportionately greater declines in the other. This could be done in several ways, but the simplest as well as the most illuminating for our purpose is to classify the sales decline percentages by given intervals, and to compute the average income declines of the industries so ranged.

Specifically, we find that 2 industries out of the 73 manufacturing groups had *sales* declines of from 1 to 10 per cent. Their average decline (simple mean of the individual percentages) was 6 per cent. But the average of their *income* declines was 8 per cent. Dividing the latter by the former figure, we have a ratio of 1.3 between the income decline and the sales decline.

Going to the next higher bracket, 6 industries suffered *sales* declines of from 10 to 19 per cent, their average being 15 per cent. But their average *income* decline was 47 per cent. Here the ratio between the two figures is 3.1, that is, sales declines ranging from 10 to 19 per cent are accompanied by income declines about three times as large.

Table 41 gives the entire distribution by 10 per cent class intervals, while the bars of Chart 38 make possible a quick comparison of the several ratios. (The total number of frequencies is only 67 instead of 73 because of the omission of four industries that showed sales increases, and two that showed declines in sales but increases in income).

TABLE 41

AVERAGE INCOME AND SALES DECLINES, 1920–21, RANGED BY SALES DECLINE CLASSES, 67 MANUFACTURING INDUSTRIES (SAMPLES OF IDENTICAL CORPORATIONS IN BOTH YEARS)

(1) AMOUNT OF SALES DECLINE	(2) NUMBER OF INDUSTRIES	(3) AVERAGE SALES DECLINE	(4) AVERAGE INCOME DECLINE	(5) RATIO OF (4) TO (3)
1 to 9%	2	6	8	1.3
10 to 19%	6	15	47	3.1
20 to 29%	18	23	61	2.6
30 to 39%	21	35	197	5.7
40 to 49%	12	43	97	2.3
50 to 59%	8	54	124	2.3

CHART 38

RATIO OF INCOME DECLINES TO SALES DECLINES, RANGED BY SALES DECLINE CLASSES, 1921 COMPARED WITH 1920