Volume Title: Prices in Recession and Recovery: A Survey of Recent Changes

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Volume Publisher: NBER

Volume ISBN: 0-87014-030-2

Volume URL: http://www.nber.org/books/mill36-1

Publication Date: 1936

Chapter Title: Manufacturing Industries in Recovery

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Chapter URL: http://www.nber.org/chapters/c5569

Chapter pages in book: (p. 285 - 353)

CHAPTER VI

MANUFACTURING INDUSTRIES IN RECOVERY

IN THE endless round of activities that make up economic life all economic agents are both buyers and sellers—buyers of goods for consumption, fabrication or sale, buyers of services for personal or business use, sellers of goods or services to be used at some stage of the productive-distributive process. All economic agents, then, stand between the shears of buying and selling prices, and are affected by unequal changes in these two sets of prices. Yet the consequences of unequal changes are brought home most immediately to two business groups—merchants and manufacturers. For these groups buying and selling price relations take the form of definite margins, price differentials relating to a specific unit of the commodities handled. When the connection is less direct, as between wage earnings and living costs, or farm income and average cost of goods purchased by farmers, the ultimate economic consequences of unequal changes may be no less important. But because the connection is less direct and obvious, the economic repercussions of shifting relations are likely to be less certain and less sharply focused. The physical processes of the economy may be expected to reflect price movements most immediately, and in the most directly measurable way, in the activities of merchants and manufacturers. These activities are far more directly motivated by specific price relations than are the activities of other classes of economic agents. In merchandising and manufacturing the calculus of business, which is a profit calculus, may be

applied on a unit basis, and corresponding action may be promptly taken to modify the number of units handled.

By virtue of thus standing midway in the stream of trade that flows from original producer to final consumer, and of buying and selling on a strictly business basis, manufacturing industries possess certain distinctive attributes which affect their activities during the cyclical fluctuations of business. But other circumstances contribute to the operating characteristics of manufacturing enterprise. Relatively heavy investment in plant and equipment is a condition of operation in nearly all manufacturing industries. Fixed overhead charges are an important element of total costs of production. Substantial changes in volume of goods produced may bring very considerable variations in cost per unit, because of the necessity of dividing a fixed total of overhead charges among a varying number of units. Such overhead charges, too, are usually difficult to adapt to changing monetary values, because they may rest upon fixed, contractual claims. A sharp fall in prices may thus bring considerable advances in the real burden of overhead costs, just as a sharp price rise may lower the real burden of overhead. This circumstance has gained in importance in recent years, because of the growth of fixed charges in manufacturing with the increased use of equipment and non-human power.[1]

[1] In 1899 overhead costs plus profits constituted approximately 24.8 per cent of the selling price of each unit of manufactured goods produced in the United States. The corresponding figure in 1929 was 28.8 per cent.

The increase of capital investment in manufacturing industries is of importance, in connection with the problem of readjustment under conditions of recession and depression, primarily because it involves an increase in the relatively fixed obligations of manufacturing enterprises. (When the capital investment is based upon a loan, the obligation is definitely fixed. When financed through stock issue, or effected through investment of surplus, the obligation is less rigid, but it may nevertheless be a strong influence upon a board of directors, striving to maintain an established dividend rate.) This is a phase of a problem with numerous ramifications. Changes in the

The point last made is a phase of a broader condition affecting the activities of manufacturing enterprises. The different elements contributing to the final selling price of manufactured products (i.e., labor, material and overhead costs) vary greatly in their sensitivity to the diverse market and monetary forces that affect the values of goods and services. In part, this is a reflection of the varying flexibility of these price and cost factors.[2] In part, it reflects differences in the degree to which forces impinging upon the price system from the outside (e.g., monetary forces) affect the elements of that system. This is in some degree a matter of original incidence, in some degree a question of varying institutional frictions. All these factors interact to yield a system of prices and of costs among manufacturing industries that is marked by extreme differences of behavior, especially during a period when volume of production and monetary values are undergoing violent changes. In the fact that the elements of this system differ widely in their power of adaptation to changed circumstances is found a major cause of economic confusion and retarded activity after a severe business recession.

The possibility of fairly rapid changes in the productivity

capital structures of industrial establishments doubtless affect the financial and operating policies of management in many ways. The mental reactions of boards of directors to changes in balance sheets and income accounts are involved, as well as the physical and monetary problems arising directly out of heavier capital investment.

The *liquidity* of fixed capital, in the sense of convertibility into money, is perhaps somewhat lower, as physical plants become larger, more durable and, in some respects, more specialized in their uses. But such liquidity was never high.

[2] The term *flexibility* is here used in the technical sense in which it defines the relation between a relative change in price and a corresponding relative change in physical quantities. The coefficient of flexibility of price is a measure of the same type as the coefficient of elasticity of demand, except that it is derived from an equation in which price is the dependent variable.

of labor and in production costs in manufacturing industries is another factor bearing upon the behavior of these industries during recession and revival. Various circumstances may give rise to increased industrial productivity. The mere closing of inefficient plants, removal of inefficient equipment, discharge of inefficient officers or workers will serve to enhance the average productivity of plants and equipment in use, although the real efficiency of the plants, equipment and men left in operation may remain unchanged.[3] Again, there is almost always a margin of unused resourcefulness and efficiency in any manufacturing plant that is likely to be exploited under the pressure of emergency. Men will work harder, more care will be taken, internal organization will be improved, wastes will be avoided, during lean years. Of a different order are those increases in productivity definitely attributable to technical advance and the installation of better equipment. The progress of invention, alone, may bring these gains. Pressure from high labor costs may serve as a stimulating factor, when technical innovations will reduce labor requirements. The rapidity with which productivity may change among manufacturing industries is per-

[3] This statement perhaps suggests a sharp line of division between inefficient and efficient plants, equipment and personnel, with inefficient units being weeded out by depression and efficient units going blithely forward. This, of course, was not the case. Among the plants that were closed (the number of manufacturing establishments in the United States, excluding those with products valued at less than $5,000 annually, declined from 209,862 in 1929 to 141,769 in 1933) were doubtless many technically efficient units. The rains of depression fall alike on the just and the unjust. And doubtless many inefficient plants, instruments and men survived the depression. But the economically weakest units (a group generally, though not entirely, coterminous with the least efficient, technically) were the most severely hit by the depression. Many factors contributed to the notable advance in productivity that came during the depression years; the raising of the average level of productive efficiency through the elimination of marginal elements was one of these.

haps not generally appreciated. Thus the records indicate that from 1921 to 1923 the output of manufacturing industries in the United States, per wage earner employed, increased 14.8 per cent. This gain represented, in considerable part, the realization of new productive opportunities opened up by the use of methods and equipment installed during the recession and depression immediately preceding. (The apparent gain in per capita output from 1919 to 1921, in manufacturing industries of the United States, was 0.8 per cent.[4] The real effect of new installations was felt during the ensuing two years.) The gain from 1921 to 1923 is the more striking in that 1921 was a year of depression, when the less efficient equipment was presumably idle, while 1923 was a year of greater activity, when all grades of equipment were more generally employed. The possibility of rapid changes in the productivity of manufacturing industries, stimulated by the pressure of depression, of high productive costs, of strong competition, or by the promise of wide markets if costs and prices may be substantially reduced, is a dynamic factor of tremendous importance in the cost structure of industry. Here, under modern conditions, is a force that may bring wide shifts in price and cost relations in manufacturing industries within a short period.[5]

[4] Measurements of per capita output are not accurate indexes of industrial productivity during periods when hours of work are being altered. Part of the true gain in productivity from 1919 to 1921 is not shown by these figures, because of the reduction of working hours in 1921. An increase of working hours from 1921 to 1923 leads to an opposite error, of over-statement, for this period. The actual gain from 1919 to 1923 was probably close to that shown by the figures cited, but the increase in productivity was greater from 1919 to 1921 and less from 1921 to 1923 than the per capita measurements indicate.

[5] Productivity changes in single industries are more striking than the averages for all manufacturing industries. Some examples are cited below:
(*Footnote 5 concluded on p. 290*)

Finally, we should note the place of manufacturing industries in the domestic economy of the United States. Of approximately 44 million persons gainfully engaged [6] in the United States in 1929, slightly more than 10 million, or 23 per cent, were engaged in manufacturing industries; in the same year 23 per cent of the total income paid out (18 out of 79 million dollars) came from manufacturing industries. These industries, of course, are of central importance as employers of labor, consumers of domestically produced raw materials, and disbursers of purchasing power. Disorganization and subnormal activity in manufacturing affect all other elements of the economic system.

Problems of Recovery in Manufacturing Industries

The condition of manufacturing industries, after the decline that began in 1929, was discussed in Chapter III. Four years of price recession, paralleled by a somewhat broken but still more severe drop in volume of production, left these

(*Footnote* [5] *concluded*)

CHANGE IN OUTPUT PER WORKER, 1919–1923 (*per cent*)	
Sugar, beet	+58.5
Explosives	+57.1
Oilcloth	+54.3
Iron and steel, blast furnaces	+51.3
Coke, not including gas-house coke	+50.0
Sugar, refining, cane	+49.0
Rubber products	+48.1
Ice, manufactured	+44.4
Petroleum, refining	+42.4
Condensed and evaporated milk	+42.2

[6] This figure, which is based upon estimates made in the study of national income, includes employed workers and entrepreneurs actually participating in productive activity. The number of persons partially employed is reduced to an equivalent number of fully employed. The total given is smaller than the Census enumeration of persons gainfully occupied, which includes all persons who usually follow a gainful occupation.

industries in a position of extreme difficulty in the winter of 1932–33. Activity was at a low ebb. The volume of output was barely half of that produced prior to the recession. The drastic decline of commodity values brought painful problems of readjustment. The buying prices of manufacturers (costs of materials and supplies) fell to low levels, but there were numerous obstacles to the prompt adjustment of selling prices to these levels. Long-term commitments affecting rental and interest payments, salary and wage scales fixed by agreement or long-established custom, the effect upon managerial minds of the increase in overhead charges assessable to each unit of the reduced output of manufactured goods, and other obstacles growing out of human reluctance to recognize and accept the implications of the change in the value of the dollar all served to retard readjustment in the field of prices. The effects of these changes were felt throughout the economic system, intensifying other elements of economic distress. The decline of manufacturing employment, the fall in manufacturing pay rolls and the curtailment of dividend payments sharply reduced the purchasing power of those drawing their incomes from manufacturing industries. The failure of the prices of manufactured goods to drop equally with those of raw materials and with the incomes of primary producers meant that the purchasing power of primary producers was reduced, in the markets for manufactured goods. The volume of trade and the standards of living of important elements of the population were inevitably lowered.

Our immediate concern is with the course and character of recovery, as it affected the manufacturing industries of the United States from the early months of 1933 to the spring of 1936. The problems of recovery in this sector of the economic system grew, in part, out of the particular situation left by recession, in part out of the inherent attributes of

manufacturing industries as a class, and in part out of the special conditions created by legislative enactments and administrative procedure during this period. It will be well to summarize certain of these problems, before turning to the record of recent changes.

The major problems of manufacturing producers, in the winter of 1932–33, centered about the restoration of volume of production and sales, and the widening of the margin between costs (including overhead costs) and selling prices. As we have seen, the differential between the costs of raw materials and the selling prices of manufactured goods had not declined, during the preceding recession, by an amount commensurate with the increase in the purchasing power of money. Relatively to prices in general, the costs of fabrication had risen. (This relative advance was in part obscured by quality reductions and by shifts to goods in lower price classes.) On this basis alone the price position of manufacturing industries was favorable to profits. But the tremendous drop in volume of production (a drop of 51 per cent from July 1929 to February 1933) had increased the relative burden of overhead costs. Such costs, in the aggregate, had been greatly extended during the pre-recession expansion, and as a result the per unit burden was particularly heavy when volume of output was curtailed. Labor costs per unit of product had been cut much more rigorously than overhead costs, but the reduction was distinctly less than that in material costs. Thus the recession brought, concurrently, a relative widening of the differential between material costs and selling price, which represents the cost of fabrication to the final consumer, and a sharp contraction of the differential between total costs and selling price, which represents the possibilities of profits to the entrepreneur. In 1931, in fact, this latter differential was negative, for manufacturing industries as a class. Greater volume and, if possible, lower fabrica-

tional costs were the obvious remedies for the difficulties of manufacturing producers.

But behind the rather narrow problem that presented itself to the individual manufacturer lay the whole tangled situation that grew out of the preceding expansion and recession. Intergroup trade had been seriously impaired by the uneven incidence of recession, with the prices and purchasing power of primary producers fallen to abnormally low levels and with the prices of manufactured goods so high, relatively, as to preclude a normal volume of sales. Evidence provided by the persistent unemployment of productive factors, by the reduced volume of production and trade, by the rapidity and violence of the changes that had brought about this situation indicated that these price relations represented true disparities, rather than permanent shifts in pre-existing relations. Correction of this schism through the raising of raw material prices relatively to the prices of manufactured goods seemed to be a necessary condition of restored activity.

This problem was related to matters of another sort, having to do with industrial productivity and production costs in manufacturing industries. Lower costs offered a means of widening the profit differential and increasing the sales of manufacturing industries. The pressure towards greater efficiency and reduced production costs was unremitting, under the stress of depression and during the first stages of recovery. But this was not merely a problem of productive technique. Costs were high, in part, because of the heritage of overhead charges from the days of high prices and hectic plant expansion that preceded the recession. The cutting of these charges, as well as the improvement of technique and the stepping-up of the pace of plant activity, was entailed in the reduction of costs.

Price readjustment, with a reduction of the discrepancies between the prices of raw and processed goods, the increase of

productivity and the lowering of fabricational costs—these were promising possibilities in the direction of recovery for manufacturing industries. From these there might be expected an enhancement of the purchasing power of primary producers, a pick-up in the volume of intergroup trade (i.e., between primary producers and manufacturing groups), and increases of employment and of the wage and dividend disbursements of manufacturing industries.

In this general program were several sets of possible conflicts. The degree to which employment might increase with an increase in the output and sales of manufacturing industries depended, in part, on the degree to which productivity had advanced in these industries. For increasing productivity would, in its first impact, work against expansion of employment. Later, the lower costs and lower prices that enhanced productivity might bring would be expected to stimulate employment. Again, heavy wage disbursements on the part of manufacturing industries would augment the purchasing power of their employees, and thus stimulate general recovery. If such disbursements, however, entailed advances in labor costs per unit of goods produced, this would be in conflict with the reduction of costs required to bring the relatively high selling prices of manufactured goods into line with general prices. In following the actual course of recovery attention must be given to these possible conflicts.

The problems we have mentioned are mainly, of course, those that arise after any recession that has altered the preexisting conditions of activity. They were acute in 1932 and 1933 because of the exceptional severity of the recession and because of certain unusual characteristics of the preceding period of expansion. In addition, some altogether novel issues arose out of the administration of the recovery program. To a greater degree than in any previous depression in our history a conscious program, directed towards the correction

of the economic ills of the day, was applied. On the monetary side price recovery was sought through departure from the gold standard, a gold-buying program and devaluation of the dollar. Under the National Industrial Recovery Act hours were limited, minimum wages were set and provision made for the control of prices over a wide range of industrial activity. Under the Agricultural Adjustment Act processing taxes were levied on important fabricational operations. The effects of this program on the production costs and selling prices of manufacturing industries, on their wage disbursements and on their production and sales are matters of special interest. Of course, the actual consequences of many of the actions taken in applying the recovery program are clouded and uncertain; it is often impossible to distinguish specific consequences of given actions. But the picture of recovery as a whole must include the conscious program, as well as the unplanned aspects of revival among manufacturing industries.

Price Changes Among Manufactured Goods and Raw Materials

We are concerned in this section with those price relations that affect the costs and profits of manufacturing industries. With respect to raw materials, then, we restrict ourselves to materials that are actually used in the processes of manufacture, excluding that important class of products going to final consumers in a raw state. Price changes during recession and in the subsequent price advance are summarized in Table 33. At the low point of the depression the prices of raw materials intended for fabrication were 51 per cent below their pre-recession values; the selling prices of manufactured goods had fallen, on the average, only 31 per cent. These values represent a notable widening of the fab-

ricational margin, reduced to per unit terms. The actual exchange situation at this low point is perhaps most strikingly defined by the ratio between these prices. At prices prevailing in February 1933 producers of raw materials for fabrication were obliged to give 41 per cent more, by volume, than in July 1929 for a constant quantity of finished goods made from their materials. The five months of rapid price change following, during which raw producers' goods advanced 31

TABLE 33

CHANGES IN WHOLESALE PRICES AFFECTING MANUFACTURERS' PRICE MARGINS, JULY 1929–JUNE 1936

RAW PRODUCERS' GOODS AND MANUFACTURED GOODS

	July 1929	*Feb. 1933*	*July 1933*	*Oct. 1933*	*May 1934*	*Sept. 1934*	*May 1935*	*Dec. 1935*	*Apr. 1936*	*June 1936*
RECESSION AND RECOVERY										
Producers' goods, raw	100	49	64	65	68	76	80	79	79	78
Manufactured goods, all	100	69	77	80	83	84	86	87	85	84
Ratio, manufactured to raw	1.00	1.41	1.20	1.23	1.22	1.11	1.08	1.10	1.08	1.08
RECOVERY										
Producers' goods, raw		100	131	132	139	154	162	161	161	159
Manufactured goods, all		100	112	117	120	123	125	127	124	122

per cent and manufactured goods advanced 12 per cent in price, reduced this ratio to 1.20. In the ten succeeding months the rate of advance in raw materials was checked; prices of processed goods continued to move upwards. The ratio defining exchange relations rose to 1.22. Drought, in the summer of 1934, gave a new stimulus to the prices of agricultural products, and by September the ratio of the prices of manufactured goods to the prices of raw producers' goods had fallen to 1.11. Minor movements during the nineteen months following further reduced the manufacturing differential. The exchange ratio in June 1936 was still unfavorable to raw materials, relatively to the pre-recession situation, but the excess volume of raw materials exchanging for a constant

quantity of fabricated goods had fallen from 41 per cent in February 1933 to 8 per cent. Here was a notable shift, indeed.[7]

These changes appear in somewhat different perspective when a more distant base is used (Table 34). The picture of

TABLE 34

CHANGES IN WHOLESALE PRICES AFFECTING MANUFACTURERS' PRICE MARGINS, 1913–1936

RAW PRODUCERS' GOODS AND MANUFACTURED GOODS

	July 1913	*Feb. 1929*	*July 1933*	*Oct. 1933*	*May 1933*	*Sept. 1934*	*May 1934*	*Dec. 1935*	*Apr. 1935*	*June 1936*	*1936*
Producers' goods, raw	100	134	66	86	87	92	101	107	106	106	104
Manufactured goods, all	100	153	105	117	123	126	129	132	133	130	128
Ratio, manufactured to raw	1.00	1.14	1.59	1.36	1.41	1.37	1.28	1.23	1.25	1.23	1.23

alternate expansion and contraction of the fabricational margin, shown in Table 33, is repeated here, but with the difference that recession starts with a margin already relatively wide. In July 1929 the average prices of manufactured goods were 53 per cent above their 1913 average; average prices of raw producers' goods were but 34 per cent higher. Thus, in

[7] Two other movements, not directly reflected in the measurements given above, played a part in the trade movements of recovery. In the early months of recovery the actual rise in the prices of manufactured goods probably exceeded the advance indicated by quoted prices. For at the low point of the depression, as a result of undercover price-cutting, realized prices were in many cases lower than those currently quoted. The first five or six months of revival brought not only the price increases indicated by the quoted prices, but additional advances from the low levels of the cut prices.

In 1934 and 1935 there was also a movement on the part of consumers back to goods of higher quality than those purchased during the worst months of the depression. This would not affect the quoted prices, but it would tend to raise the prices realized by manufacturers by higher percentages than those given in Table 33. Not until 1935 Census data are available will it be possible to estimate the relative importance of these factors, in causing divergent movements of realized and quoted prices.

exchange for a constant quantity of manufactured goods 14 per cent more, by volume, had to be given by primary producers in 1929 than in 1913. Subsequent changes with reference to the 1913 base are thus more pronounced than when measured on the July 1929 base. The final records for June 1936 indicate that the prices of raw producers' goods were 4 per cent above their pre-War level, the prices of manufactured goods 28 per cent above that level, while the ratio defining exchange relations was 1.23. The wide disparity of the winter of 1932–33 had been reduced, but the prices of these two classes of goods were still far removed from their pre-War relations.

These changes in the relations between the prices of raw producers' goods and the prices of the manufactured goods into which they enter are the more striking when compared with the shifts during a period of similar length prior to the War. Between 1891 and 1913 the prices of raw producers' goods in wholesale markets rose, on the average, 23 per cent; prices of manufactured goods advanced 11 per cent. The ratio defining the exchange relations between goods of these classes declined from 1.00 to .90. That is, the volume of raw producers' goods required in exchange for a constant quantity of manufactured goods declined 10 per cent from 1891 to 1913. Between 1913 and June 1936 this quantity increased 23 per cent. The sustained pre-War tendency towards a cheapening of manufactured goods, relatively to raw materials, stands in clear contrast to the post-War tendency towards the cheapening of raw materials.

In interpreting this apparent shift the limitations of our measurements must be kept in mind. To the extent that quality changes have occurred among the manufactured goods represented in the standard quotations entering into the price index numbers cited, these index numbers are in error. There have been such changes, with considerable

improvements in the quality of the finished goods bought by final consumers. The difficulty of evaluating these improvements and securing series of prices for finished goods truly comparable with the prices of raw materials is a serious impediment to an accurate review of the changing relations among producing groups.

Striking as these quality changes have been for certain classes of goods, such as automobiles, there is no reason to believe that the quality of finished consumers' goods as a broad class was improved between 1913 and 1936 to a degree sufficient to offset the price shift noted. The exchange value of primary products fell and that of finished consumers' goods rose between these years. The consequences of this shift have been far reaching.

Before attempting to appraise these movements we should trace the incidence of recovery in somewhat greater detail, as it affected related groups of raw producers' goods and of processed goods. Measurements for certain of these groups are given in Table 35. The relations between the prices of processed goods and raw materials in the several groups, at the low point of the recession, are perhaps most effectively summarized by the ratios given with each set of comparisons. The greater the ratio, of course, the wider is the price margin between raw and processed goods and the less favorable is the trading position of primary producers.[8] For crops and

[8] Here and elsewhere the argument of this monograph proceeds on the assumption that the 'trading position' of a producing group may be defined in terms of relative prices. For a fully accurate definition of trading position account should be taken of other factors (such as productivity, average and marginal production costs, volume of production and sales, etc.). But price relations constitute a major factor in the fixing of trade positions. Changes in trading positions over the relatively short periods covered by a business cycle are predominantly influenced by changes in price relations. Over longer periods changes in trading position may not be so accurately defined in terms of relative selling prices.

TABLE 35

CHANGES IN WHOLESALE PRICES AFFECTING MANUFACTURERS' PRICE MARGINS, JULY 1929–JUNE 1936

CROPS, ANIMAL PRODUCTS AND MINERAL PRODUCTS

	July 1929	*Feb. 1933*	*July 1933*	*Oct. 1933*	*May 1934*	*Sept. 1934*	*May 1935*	*Dec. 1935*	*Apr. 1936*	*June 1936*
RECESSION AND RECOVERY										
Crops										
Producers' raw	100	38	66	58	64	81	79	71	72	72
Processed	100	65	82	85	86	89	90	90	85	84
Ratio, processed to raw	1.00	1.71	1.24	1.47	1.34	1.10	1.14	1.27	1.18	1.17
Animal products										
Producers' raw	100	34	46	43	45	53	71	74	73	69
Processed	100	54	63	67	70	75	82	86	82	80
Ratio, processed to raw	1.00	1.59	1.37	1.56	1.56	1.42	1.15	1.16	1.12	1.16
Minerals										
Producers' raw	100	70	76	86	88	88	88	90	91	90
Processed	100	80	82	85	89	88	87	87	88	87
Ratio, processed to raw	1.00	1.14	1.08	.99	1.01	1.00	.99	.97	.97	.97
Metals										
Producers' raw	100	63	78	79	82	82	83	85	85	84
Processed	100	81	81	83	90	88	87	87	87	87
Ratio, processed to raw	1.00	1.29	1.04	1.05	1.10	1.07	1.05	1.02	1.02	1.04
RECOVERY										
Crops										
Producers' raw		100	172	150	169	212	206	186	188	188
Processed		100	126	131	132	137	138	139	130	129
Animal products										
Producers' raw		100	138	127	134	159	212	220	217	206
Processed		100	115	122	128	138	150	157	150	146
Minerals										
Producers' raw		100	110	124	126	127	127	130	130	130
Processed		100	102	106	111	110	108	108	109	109
Metals										
Producers' raw		100	123	126	130	130	131	135	134	133
Processed		100	101	104	112	109	108	108	108	108

animal products the ratios in February 1933 are not far apart—1.71 and 1.59. Producers of raw mineral products were in a stronger position, with a ratio of 1.14. After the first five months of swift recovery, during which raw farm crops advanced 72 per cent in price, raw animal products 38 per cent and raw minerals 10 per cent, these ratios were substantially reduced. For raw crops and animal products the next ten months witnessed a reversal of these movements. While the prices of raw products lost ground, or barely maintained the July 1933 level, processed goods continued to advance and the ratios defining the exchange relations between raw and processed goods rose. Only for minerals did the ratio continue to fall, reaching 1.01 in May 1934.[9]

Four months of drought and crop destruction again reversed the situation; the prices of raw crops rose sharply and the ratio of the average price index numbers of processed and raw crops, on the July 1929 base, fell to 1.10. In June 1936 this ratio stood at 1.17. For animal products the initial gain brought by the drought was much smaller, but drought and production limitation had important after effects. Prices advanced sharply in the early months of 1935, and most of these gains were held. The price ratio of processed goods to raw materials, for animal products, was 1.16 in June 1936, as against values of unity in July 1929, 1.59 in February 1933.

Still greater alterations occurred in the ratios between the indexes of prices of processed products and raw materials, with reference to a pre-War year. The ratios in Table 36 define the degree of cheapening of raw materials, in relation to the processed goods into which they enter. They may also

[9] The subgroup measurements indicate that raw metals were still at some disadvantage, in May 1934. Non-metallic minerals are not listed as a separate division, since the raw and processed goods included in this category are not strictly comparable.

TABLE 36

CHANGES IN WHOLESALE PRICES AFFECTING MANUFACTURERS' PRICE MARGINS, 1913–1936

CROPS, ANIMAL PRODUCTS AND MINERAL PRODUCTS

	1913	*July 1929*	*Feb. 1933*	*July 1933*	*Oct. 1933*	*May 1934*	*Sept. 1934*	*May 1935*	*Dec. 1935*	*Apr. 1936*	*June 1936*
Crops											
Producers' raw	100	136	52	90	78	88	110	108	97	98	98
Processed	100	143	93	117	122	123	128	129	130	121	120
Ratio, processed to raw	1.00	1.05	1.79	1.30	1.56	1.40	1.16	1.19	1.34	1.23	1.22
Animal products											
Producers' raw	100	148	50	68	69	66	79	106	110	108	103
Processed	100	167	91	105	112	117	126	137	143	137	133
Ratio, processed to raw	1.00	1.13	1.82	1.54	1.78	1.77	1.59	1.29	1.30	1.27	1.29
Minerals											
Producers' raw	100	135	94	103	116	119	120	119	122	123	123
Processed	100	152	122	125	130	136	134	132	132	133	133
Ratio, processed to raw	1.00	1.13	1.30	1.21	1.12	1.14	1.12	1.11	1.08	1.08	1.08
Metals											
Producers' raw	100	128	81	100	102	105	105	106	110	109	108
Processed	100	164	133	133	137	149	144	144	143	143	143
Ratio, processed to raw	1.00	1.28	1.64	1.33	1.34	1.42	1.37	1.36	1.30	1.31	1.32

be interpreted as measures of the changing physical quantities of raw producers' goods required in exchange for fixed quantities of the manufactured goods into which the given raw materials enter. Since the vicissitudes of the last seven years have already been traced, our present interest attaches to the entries for the last months recorded.

Reduction in relative value, with reference to the 1913 base, was more extreme in June 1936 for animal products than for the two other main groups represented. In this

month 29 per cent more than in 1913, by volume, had to be given by producers of raw animal products in exchange for a fixed quantity of the same goods in fabricated form. The corresponding figure for the low month of the depression was 82 per cent. For farm crops a 79 per cent disability, in February 1933, had been reduced to one of 22 per cent. Among minerals the June 1936 ratio was 1.08 as against 1.30 at the depression low. Raw metals, however, were much cheaper than minerals as a class, relatively to their processed forms. The June 1936 index was 108 (with 1913 as 100), as compared with 143 for processed metal products. The exchange ratio was 1.32.

The effects of recovery on manufacturing differentials among farm and non-farm products are defined more sharply in Table 37. We have already noted the widening of the differential between the prices of farm products in raw and processed form during the recession. While processed goods fell 40 per cent, raw producers' goods of this class fell 63 per cent, the ratio between the two increasing from 1.00 to 1.62 between July 1929 and February 1933. Within the ensuing forty months the prices of these raw materials advanced 97 per cent; prices of processed farm products rose 39 per cent. The ratio between them was reduced from 1.62 to 1.15. Here was a very substantial gain indeed. In contrast, the records for raw and processed goods not originating on American farms show no such declines during recession, and much smaller advances during recovery. In June 1936 the index numbers for these two groups, on the July 1929 base, were 85, as compared with 72 and 83 for raw and processed farm products. The ratio defining exchange relations between raw and processed non-farm products never rose to the extreme heights found among agricultural products.

TABLE 37

CHANGES IN WHOLESALE PRICES AFFECTING MANUFACTURERS' PRICE MARGINS, JULY 1929–JUNE 1936

PRODUCTS OF AMERICAN FARMS AND OTHER PRODUCTS

	July 1929	*Feb. 1933*	*July 1933*	*Oct. 1933*	*May 1934*	*Sept. 1934*	*May 1935*	*Dec. 1935*	*Apr. 1936*	*June 1936*
RECESSION AND RECOVERY										
Products of American farms										
Producers' raw	100	37	57	51	56	70	78	74	74	72
Processed	100	60	73	77	79	84	88	90	85	83
Ratio, processed to raw	1.00	1.62	1.28	1.51	1.41	1.20	1.13	1.22	1.15	1.15
Products other than those originating on American farms										
Producers' raw	100	64	74	81	83	83	82	85	85	85
Processed	100	77	80	83	86	85	84	85	85	85
Ratio, processed to raw	1.00	1.20	1.08	1.02	1.04	1.02	1.02	1.00	1.00	1.00

	Feb. 1933	*July 1933*	*Oct. 1933*	*May 1934*	*Sept. 1934*	*May 1935*	*Dec. 1935*	*Apr. 1936*	*June 1936*
RECOVERY									
Products of American farms									
Producers' raw	100	155	140	152	190	213	202	202	197
Processed	100	122	129	132	140	147	150	142	139
Products other than those originating on American farms									
Producers' raw	100	115	123	130	129	128	133	133	133
Processed	100	104	103	112	110	110	110	111	111

From 1.00 in July 1929 this ratio advanced to 1.20 at the low point of recession, and dropped again to 1.00 in June 1936. Pre-recession exchange relations had been restored, substantially, by 1936. (These figures, of course, are averages.

For many individual commodities the relations were markedly different.)

Various other classifications are of interest in tracing changes in the fabricational margin during recovery. Our present purpose will be served by a study of ratios relating to four selected commodity groups. The detailed measurements from which these are derived are given in Appendices III and IV.

In July 1929 the relative prices of processed producers' goods intended for capital equipment and processed con-

TABLE 38

CHANGES IN WHOLESALE PRICES AFFECTING MANUFACTURERS' PRICE MARGINS AND THE TRADING RELATIONS BETWEEN PRODUCING GROUPS, 1913–1936

COMMODITY GROUPS COMPARED	RATIO OF INDEX OF PRICES OF PROCESSED GOODS TO INDEX OF PRICES OF RAW MATERIALS OR SEMI-FINISHED GOODS										
	July 1913	*Feb. 1929*	*July 1933*	*Oct. 1933*	*May 1933*	*Sept. 1934*	*May 1934*	*Dec. 1935*	*Apr. 1935*	*June 1936*	*1936*
Producers' goods for capital equipment, processed and raw	1.00	1.19	1.65	1.27	1.32	1.34	1.29	1.30	1.25	1.23	1.26
Consumers' goods, processed, and producers' goods intended for human consumption	1.00	1.21	1.77	1.38	1.49	1.46	1.36	1.34	1.37	1.35	1.36
Foods, processed consumers' goods and producers' goods	1.00	1.04	1.53	1.17	1.32	1.29	1.12	1.08	1.17	1.11	1.11
Non-foods, processed consumers' goods and producers' goods for human consumption	1.00	1.37	1.97	1.58	1.68	1.62	1.61	1.61	1.57	1.60	1.60

sumers' goods stood 19 and 21 per cent, respectively, above the relative prices of the corresponding materials of fabrication, the reference base being 1913. These ratios reflect the post-War over-valuation of processed goods, relatively to pre-War standards. When the margins opened by the price changes of the recession are superimposed upon these earlier differentials we have very high ratios indeed, during the depression. In February 1933 the ratios were 1.65 and 1.77, respectively, for capital goods and consumers' goods. By June 1936 these had fallen to 1.26 and 1.36—still substantially greater than in 1913. In terms of intergroup trade, the first of these ratios meant that producers of goods intended, after processing, for capital equipment, had to give 26 per cent more than in 1913, in physical volume, for a constant quantity of processed capital equipment. The other ratio may be similarly interpreted. Only very great shifts in relative productivity and in costs of production could prevent such changes from bringing important modifications in economic status. There is no evidence that such compensating shifts in productivity did occur, among the classes of goods cited.[10]

Breaking the second of these categories into foods and non-foods, we have the last two sets of ratios shown in Table 38. The divergence between the prices of unfinished and finished goods intended for human consumption has been most pronounced among non-foods. The persistence of relatively high prices for finished goods in the latter group has been the prime factor in this divergence. In February 1933 the ratio for non-foods was practically double the 1913 value.

[10] Here, also, we should note that advances in the quality of finished goods, if account could be taken of them, would lower these ratios. An average unit of finished goods represented more in 1936 than in 1913, in terms of utility. For capital goods the gain in quality may have been sufficient to offset the price disadvantage of the primary producer; this could hardly have been true for processed consumers' goods.

In terms of physical trade this meant that producers of raw materials of this type were called upon to give twice as much as in 1913 for a constant quantity of finished goods. By June 1936, the ratio had fallen to 1.60 for consumers' non-foods, a figure still very high indeed by earlier standards. Here is one of the major changes in price relations that recent years have brought. Relatively to the cost of raw materials, the cost of the services performed in the manufacturing of non-food products intended for direct human consumption and use has increased greatly. Among foods the ratio in June 1936 was much lower, 1.11 as against 1.00 in 1913.

In this section we have sought to trace recent changes in the two-sided market relations of manufacturing industries, relations with raw material producers on the one hand, with the buyers of manufactured goods on the other. We pass to a more intensive study of manufacturing industries during recovery, a review of internal operating conditions as well as relations with outside buyers and sellers.

On Recent Changes in Production, Prices, Employment and Wages in Manufacturing Industries

The low point of the depression, in manufacturing industries as in other economic activities, was reached, in the United States, late in the winter of 1932–33.[11] The period

[11] It is perhaps open to question whether this revival in the United States should be dated from February–March 1933, or from mid-summer 1932. The physical volume of production of producers' goods reached lower levels in 1932 than in 1933; the number of wage earners employed was as low in 1932 as in early 1933. On the other hand, aggregate wage disbursements, average prices at wholesale and electric power production fell to lower levels in 1933. The domestic statistical evidence is thus conflicting, on the interesting question whether the downswing that accompanied the political uncertainties of late 1932 and early 1933 marked a continuation of recession and depression, or a check to recovery that had already started. (As regards

of three years that followed brought a substantial recovery. By February–March 1936 the average selling prices of manufactured goods, at wholesale, had risen 25 per cent; the volume of manufacturing production had increased 58 per cent, the total number of persons employed 40 per cent, and total wage disbursements 92 per cent.

Particular interest attaches to the nature of this recovery, because of the novel elements that played a part in it, to which attention has already been drawn. The forces operating in the traditional revival were, in this instance, compounded in complex ways with elements of a consciously formulated program of recovery. For this reason it is of interest to know whether there were shifts in the internal processes of recovery that might have been associated with special elements of the recovery program. Again, we may ask whether this recovery conformed, in general, to the pattern of earlier business revivals. This question is pertinent today not only as a matter of historical interest but also because it bears upon the probable future course of recovery. We may not appraise current economic changes solely in relation to past standards, but reference to these standards may illuminate the present situation.

There are more specific questions centering about the recovery program, as it affected manufacturing industries. What was the effect of the novel conditions of 1933–36 upon industrial productivity? How were labor costs in manufacturing plants affected? What increase occurred in the aggregate purchasing power of manufacturing labor? Did this increase differ in important ways from the customary expansion of labor's purchasing power during business revival? These, and the more general questions suggested above, deal with mat-

world conditions generally, a recovery seems to have begun in 1932.) For the present purpose, it is desirable to measure changes from the low point of early 1933.

ters of major importance today, when recovery is being sought under an intermixture of old and new conditions. Not all these questions may be answered definitely, but their urgency justifies an attempt to cull from available data evidence relevant to these central issues.

This attempt has been made in preparing the measurements given in this section. Certain of the items are subject to a considerable margin of error, because of limitations upon the coverage of the original records utilized, or because of imperfect comparability of series drawn from different sources. Recognition of this margin of error, of the type that is present whenever representative data are employed, is necessary in using the detailed figures given below. But the general consistency of the results secured leaves no doubt as to the substantial truth of the evidence drawn from these records.

The records of recovery are to be interpreted with reference to the background of the preceding recession, as this affected manufacturing industries. Over a period of less than four years the physical volume of manufacturing production had been cut in half, the average selling price of manufactured products had fallen 31 per cent and the aggregate gross income of manufacturing enterprises had been reduced almost two-thirds. The number of employed wage earners had fallen approximately 43 per cent, the average hourly wage had declined some 22 per cent and average earnings per wage earner had dropped 39 per cent. Total wage disbursements of manufacturing industries had declined 65 per cent; taking account of changes in living costs, this meant a loss of approximately 50 per cent in the actual aggregate purchasing power of manufacturing labor. In no recent business recession have equal losses been suffered by manufacturing industries. The price decline of 1920–21 exceeded the drop of 1929–33, it is true, and in other respects the first post-War

recession was of a magnitude roughly comparable to the most recent decline. But in prolonged severity the recession and depression of 1929–33 have no counterpart in the economic records of recent years. Reflections of the drastic preceding recession will appear in the movements of recovery, which may be dated from the early months of 1933.

This recovery was spotty and uneven, probably less homogeneous than any similar period of economic revival of which we have record. Relief from the immediate fears engendered by the banking crisis, a series of developments affecting the present and anticipated value of the dollar, the prospect, and then the reality, of extensive changes in operating and marketing conditions growing out of the adoption of industrial codes, fundamental changes in the conditions affecting the issuance of new securities and the allocation of investment funds, the initiation of Federal expenditures for relief on a hitherto unprecedented scale—these followed one another in rapid succession. Within three years the business 'climate' underwent a series of changes such as might normally have been spread over many years. These and other developments affected the shifting course of recovery among manufacturing industries between February 1933 and the spring of 1936. The first sharp spurt, which carried to mid-summer of 1933, was followed by a recession, extending to the end of 1933, a spring revival in 1934, a set-back through the summer months, a recovery in the winter of 1934, a mild contraction in the spring of 1935, and a notable advance carrying into the winter of 1935–36.

Some new factors were present in each of these periods, but the most notable differences separate the first phase of sharp expansion from the alternations of contraction and expansion that follow. These differences lie, partly, in the extent of the movements. The first recovery far exceeded in magnitude the up-turns that followed. Again, the first rise and the later

movements are characterized by important differences in operating conditions, in the field of manufacturing. The first of the codes introduced under the National Industrial Recovery Act was approved on July 9, 1933; the blanket code authorized under the President's Re-employment Agreement had been accepted by 700,000 employers by August 1st. The operating conditions prevailing in manufacturing industries underwent a major change with the inauguration of the codes. In this fundamental respect, then, the circumstances attending the first phase of recovery, up to the summer of 1933, are clearly distinct from those prevailing up to May 1935. It is true that the prospect of operation under the codes helped to stimulate the early advance and affected its character. But the detailed regulations later prescribed under the industrial codes did not, of course, affect operating conditions during this first surge of recovery.

We must recognize that many factors, other than the codes, distinguish the first phase of recovery from the period that followed. The stimulus of monetary change was a potent force in the first surge of renewed activity. Hopes and fears centering in the prospects of inflation were stronger during the first few months than later. Production for stock was probably more important during the first phase, and such production would leave its impress upon the movements of the later period. The potentialities of rapid advance in productivity and sharp reduction of operating costs were greater at the very low level of activity prevailing in February 1933 than after the bloom of the first revival had passed. The factors affecting operating conditions over a short period differ in various ways from those dominant over a longer interval. It would be improper to attribute to the influence of the industrial codes all the differences we shall note between the operating conditions prevailing in manufacturing industries prior to and following the adoption of these codes.

Yet these differences are part of the data required for an appraisal of the codes and of the shifting currents of economic change from 1933 to 1936.

For these reasons, then, we shall break the period of recovery here reviewed into three phases—that covering the sharp rise from February–March 1933 to June–July 1933, the period from the summer of 1933 to April–May 1935, and the phase from April–May 1935 to February–March 1936. Operation under the codes ceased, of course, following the Supreme Court decision of May 27, 1935. Since the turning points that mark off these periods of recovery are not clearly to be located in one particular month, and since they do not coincide, in time, for all the series to be followed, the limits of the several periods are set with reference to averages of measurements covering two months.

THE DATA, AND SOME LIMITING CONDITIONS

The basic series from which all other measurements are derived, in tracing the changes of recovery, are given in Table 39, in relative form. These series are based upon records of production, employment, pay rolls, hours and selling prices relating to the operations of the major manufacturing industries of the United States.

The general changes during the recovery phases distinguished in Table 39 are familiar. The first spurt of recovery carried all series upward, the advance of 45 per cent in production being outstanding. The changes of the twenty-two months following (the period of general operation under the codes) brought a slight rise in production, further notable advances in prices, pay rolls and number employed, and a pronounced decline in average hours worked per week. The first ten months of the post-NRA operation, in 1935–36, witnessed a rise in output and increases in number of wage

TABLE 39

A RECORD OF THE FORTUNES OF MANUFACTURING INDUSTRIES OF THE UNITED STATES, 1933–1936

BASIC MEASUREMENTS [1]

	February–March 1933	*June–July 1933*	*April–May 1935*	*February–March 1936*
Physical volume of production	100	145	148	158
Number of wage earners employed	100	115	136	140
Total wage disbursements (pay rolls)	100	127	180	192
Average number of working hours per week, per person	100	114	97	102
Average selling price of products	100	109	125	125

[1] Descriptions of the series given in this table will be found in Appendix VIII-A. The reader should note that the production index of the Board of Governors of the Federal Reserve System, on which the present measurements of production changes rest, shows an advance of 57 per cent from February–March to June–July 1933. But the compiling authorities call attention to the fact that this advance was somewhat distorted by the sharp rise in the output of semi-finished goods in that period. The rise in general manufacturing production was smaller. The figure of 45 per cent used in the present analysis is a corrected measurement. The basis of correction is explained in Appendix VIII-A.

Because of this correction, the measurements given in this chapter differ somewhat from those given in *Bulletin 56* of the National Bureau of Economic Research, in which the results of this analysis were first published.

The monthly indexes of average selling prices of manufactured products are compared with index numbers based on the records of the Census of Manufactures in Appendix VIII-B.

earners employed, in wage disbursements and in average working hours. No change occurred in the average selling price of manufactured products.

But a more detailed comparison of these movements is required to bring out the distinctive features of the period that opened with the spring revival of 1933. In making such comparisons and in deriving the requisite measurements we must recognize the limitations of the data. There are some dif-

ferences in the degrees of coverage of the series listed above. Pay roll and employment statistics are drawn from 90 manufacturing industries. Records of average hours worked per week are secured from a smaller number of establishments, representing a somewhat smaller number of manufacturing industries—87 in December 1935. (Only those industries are included for which information concerning hours of labor covers at least 20 per cent of all employees.) Price and production records relate to still other samples of manufacturing operations at large—broad samples, but not the same, in detail, as those from which the first figures come. Comparison of these records and the derivation of measurements from such comparisons must proceed on the assumption that each of the basic series is representative of manufacturing industries in general. Since this assumption is made in the pages that follow, the various derived figures should be looked upon as indexes of general tendencies, not as highly accurate measurements of detailed movements.

In respect of timing, certain other difficulties face us in making comparisons. The basic production statistics are monthly averages or aggregates, while the records of employment, pay rolls and hours for each month are derived from data relating to the week ending at the date nearest the middle of the month. The original price quotations vary in this respect, some being averages of daily figures, some averages of weekly quotations, some quotations as of specific dates. Each set of figures may be taken, however, to be generally representative of conditions prevailing in given months. Greater difficulties are introduced by the fact that the final emergence of finished manufactured products lags behind the expenditure of labor and of money in the preliminary productive processes. This lag is not a serious barrier to accurate comparison of statistics of final production and statistics relating to the earlier processes of production, if the

flow of materials be reasonably steady. When the process is extended, however, and when variations in the rate of flow are considerable, the accuracy of comparisons of concurrent statistics is lessened. Records of employment and pay rolls relating to a period of reduced activity may be set against a flow of finished products resulting from a preceding period of excessive activity. Conversely, technical conditions of production may force the maintenance of a considerable labor force even though the production of finished products has been sharply reduced. The automobile industry, with its periods of preparation for the output of new models, and the steel industry furnish examples of production and labor statistics not always strictly comparable on a current monthly basis. If the lags were constant account could be taken of them, but in some industries they vary appreciably from time to time.

The seasonal factor also complicates the task of comparison. Some of the basic series compared are subject to seasonal fluctuations, others are not. However, there are real doubts whether the customary seasonal movements have prevailed, in all cases, under the abnormal conditions of severe depression. In some instances it is certain that they have not. Moreover, the magnitude of the usual seasonal movements is much smaller than the changes here recorded. For these reasons it has seemed desirable to attempt no correction for assumed seasonal variations. The actual records of manufacturing operations have been utilized.

Various technical difficulties of the types mentioned are faced in the comparative study of month-to-month fluctuations. Those general movements that persist over longer periods will not be obscured, however, by the erratic changes arising from varying temporal relations of production, employment and prices. In the comparisons actually made in the following pages the difficulty introduced by erratic month-

to-month movements is met, in part, through the comparison of averages for several months, rather than indexes for single months. Even so, not too much weight should be attached to extreme movements for limited periods, in records relating to single industries. When the records for different industries support one another, however, and when movements persist over time, it is justifiable to conclude that we are dealing with significant changes, and not with erratic fluctuations resulting from shifting leads and lags among the series compared.

With these considerations and limitations in mind, we may draw such information as we can from the basic measurements in Table 39. The index numbers presented in Table 40,

TABLE 40

A RECORD OF THE FORTUNES OF MANUFACTURING INDUSTRIES OF THE UNITED STATES, 1933–1936

DERIVED MEASUREMENTS [1]

	February–March 1933	*June–July 1933*	*April–May 1935*	*February–March 1936*
Gross income	100	158	185	198
Total employment (man hours)	100	131	132	143
Average output per wage earner	100	126	109	113
Average output per man hour	100	111	112	110
Average earnings per wage earner	100	110	132	137
Average hourly wages	100	97	136	134
Average labor cost per unit of product	100	88	122	122

[1] Explanations of the methods employed in deriving these index numbers will be found in the notes in Appendix VIII-A.

which have been derived from those in Table 39, define important aspects of the changes occurring in this period of revival. The five basic series and the seven sets of derived measurements constitute the materials of the following analysis. Using these, we may follow the course of recovery

and note certain changes in the operating conditions of manufacturing industries and in the relations of these industries to other elements of the national economy.[12]

[12] In this survey we shall use the measurements given in Tables 39 and 40, which are taken to be representative of the movements in manufacturing industries at large in the United States. Attention has been drawn to the lack of perfect comparability among some of the series employed. However, the general conclusions drawn from these comparisons are supported by evidence relating to smaller samples of major manufacturing industries for which more truly comparable measurements of production, employment and pay rolls are available. These industries include those producing iron and steel, automobiles, cigars and cigarettes, cement, leather, boots and shoes, rubber tires and inner tubes, lumber, woolen and worsted goods, cotton goods, carpets and rugs, and flour, and the meat packing, sugar refining and petroleum refining industries. Measurements for this substantial group of 15 manufacturing industries are given below, together with measurements for all manufacturing industries. In addition, figures are given for 13 industries—the 15 in the above list, less automobiles and cotton textiles. The cotton textile industry was marked by distinctive changes during the recovery of 1933–36, and some special difficulties are faced in the automobile industry in respect of the comparability, in time, of the production records and employment and pay roll statistics.

	February–March 1933	*June–July 1933*	*April–May 1935*	*February–March 1936*
Gross income				
All manufacturing industries	100	158	185	198
15 industries	100	195	248	252
13 industries	100	190	210	229
Total employment (man hours)				
All manufacturing industries	100	131	132	143
15 industries	100	150	143	150
13 industries	100	150	135	148
Average output per wage earner				
All manufacturing industries	100	126	109	113
15 industries	100	139	126	128
13 industries	100	136	110	118
Average output per man hour				
All manufacturing industries	100	110	112	111
15 industries	100	114	127	123
13 industries	100	109	109	108

(*Footnote [12] concluded on p. 318*)

THE RECOVERY OF 1933–1936

In following changes in the operations of manufacturing industries since the early months of 1933 various combinations of the measurements presented in Tables 39 and 40 may be used. Each combination will contain a single series of major importance and two of its component elements. In each instance the movements of the three related series should be compared. The measurements entering into the various combinations are brought together in Table 41. The subsequent discussion should be followed with reference to the detailed entries in this table.

(*Footnote* 12 *concluded*)

	February–March 1933	*June–July 1933*	*April–May 1935*	*February–March 1936*
Average earnings per wage earner				
All manufacturing industries	100	110	132	137
15 industries	100	121	151	156
13 industries	100	122	145	154
Average hourly wages				
All manufacturing industries	100	97	136	134
15 industries	100	99	152	149
13 industries	100	99	144	142
Average labor cost per unit of product				
All manufacturing industries	100	88	122	122
15 industries	100	87	120	122
13 industries	100	90	132	131

The smaller samples, which are rather heavily weighted by basic industries, show more violent fluctuations in gross income and total employment than are found in manufacturing industries at large, but the various derived measurements show movements of the same general character. (It should be noted that the figures for the smaller groups and for all manufacturing industries for June–July 1933 are not independent, in respect of output per man hour and labor cost per unit of product. These two series for the smaller groups have been used in revising production figures for all industries for this period, correcting for the bias noted on an earlier page. See also Appendix VIII-A.) This set of measurements, more carefully controlled than are the figures for all industries, serves to check the general conclusions suggested in the text.

TABLE 41

MANUFACTURING OPERATIONS, 1933–1936

A COMPARISON OF MOVEMENTS DURING DIFFERENT PHASES OF RECOVERY

	PERCENTAGE CHANGE FROM			
	Feb.–March 1933 to June–July 1933	*June–July 1933 to April–May 1935*	*April–May 1935 to Feb.–March 1936*	*Feb.–March 1933 to Feb.–March 1936*
Gross income and its elements				
1. Gross income	+58	+17	+6	+98
2. Production (physical volume)	+45	+2	+7	+58
3. Selling price of products (average)	+9	+15	—1	+25
Employment and its elements				
4. Total employment (man hours)	+31	+1	+7	+43
5. Wage earners employed	+15	+18	+2	+40
6. Working hours per person (average weekly)	+14	—15	+5	+2
Production and its elements				
2. Production	+45	+2	+7	+58
5. Wage earners employed	+15	+18	+2	+40
7. Output per wage earner (average)	+26	—14	+5	+13
4. Total employment (man hours)	+31	+1	+7	+43
8. Output per man hour (average)	+10	+1	0	+11
Wage disbursements and elements				
9. Wage disbursements	+27	+42	+7	+92
5. Wage earners employed	+15	+18	+2	+40
10. Earnings per wage earner (average)	+10	+20	+5	+37
4. Total employment (man hours)	+31	+1	+7	+43
11. Hourly wages (average)	—3	+40	0	+34
2. Production	+45	+2	+7	+58
12. Labor cost per unit (average)	—12	+39	0	+22

MANUFACTURING GROSS INCOME AND COMPONENT ELEMENTS

Changes in the gross income of manufacturing industries may result from changes in the number of units produced, or in the average selling price per unit. The first three sets of measurements in Table 41 define these movements during the recovery of 1933–36.[13] In tracing these movements effective comparisons may be made between the changes in the sharp revival of the first four months, during the next twenty-two months of general operation under the codes, and in the final period of ten months, following the termination of NRA.

The net gains of the entire period were substantial, 98 per cent in gross income, resulting from advances of 58 per cent in volume of production and 25 per cent in average price per unit. But the gains were not divided equally among the three phases of recovery. In the short pre-code period all the series advanced, with rising output as the major factor in the notable pick-up in gross income. During the era of code installation and operation under the codes output advanced only slightly; rising prices were the chief element in a 17 per cent increase in gross income. This increase continued in the post-code period, in 1935–36, with rising production as the active factor in the advance. Prices declined slightly.

Of course, many forces operated during all three periods. Anticipation of the codes played a part in the first advance. A natural reaction from the tremendous activity of the first advance, activity leading to production of goods in excess of current needs, is reflected in the record of the second phase. We shall have a better basis for judgment concerning the

[13] In all threefold comparisons of this sort the figure relating to one series is the product of the corresponding figures for the two other series, in the sense that $1.58 = 1.45 \times 1.09$.

part played by code enforcement in the changes of these periods when we have pressed our inquiry further, for the changes defined by certain of the other series are more closely connected with code provisions. The factors affecting total employment are in this category.

TOTAL MANUFACTURING EMPLOYMENT AND COMPONENT ELEMENTS

Total employment is properly measured in terms of man hours. Changes in the number of persons employed and in the average hours of work affect this total. Items (4), (5) and (6) of Table 41 summarize the record of recovery in these elements. The notable increase of 31 per cent in total employment in the pre-code period resulted from almost equal advances in the number employed and in the average number of hours worked per wage earner. Between mid-summer 1933 and April–May 1935 the volume of employment showed no large net change. There was a considerable decline in average hours worked, which was offset by an increase in the number employed. These changes, of course, are manifestations of definite elements of the recovery program. There was spreading of work under the codes. In April–May 1935 a volume of employment about 1 per cent greater than that prevailing when the codes went into effect was shared among a body of workers some 18 per cent larger. In the ten months following the termination of the codes manufacturing employment rose 7 per cent, both number of workers and average hours worked increasing. The period of recovery as a whole shows substantial increases in total employment and in number of persons employed, with a rise of 2 per cent in the average number of hours worked, per person.

PHYSICAL VOLUME OF MANUFACTURING PRODUCTION AND COMPONENT ELEMENTS

Changes in the volume of manufacturing production may be viewed as the resultants (though not necessarily in a causal sense) of changes in the number employed and in output per worker. Items (2), (5) and (7) of Table 41 relate to these series.

The sharp advance in volume of production during the pre-code period was achieved through an increase in the number of workers and a still more pronounced increase in output per person employed. (The latter gain was partly attributable, of course, to an increase in hours of work.) These were changes of the sort usual in revival, though of exceptional magnitude. A gain of 45 per cent in volume of output, from the very low level of early 1933, carried with it, almost inevitably, a notable advance in output per person, per machine in use, and per man hour. (We would misread the figures if we should take this gain to be the result of a great technical revolution. No such revolution occurred during this brief period of four or five months. The potential advantages of earlier improvements, technical and otherwise, could be realized when this sharp gain in volume of output occurred.) During the twenty-two months of general operation under the codes the number employed continued to increase. Output per person declined, however, and aggregate production increased only 2 per cent. The post-NRA phase was marked by an increase of 7 per cent in total output, a slight increase in the number of workers, and a renewed advance in output per worker.

Changes in the average length of the working week affect the preceding measurements of output per person. In Table 41 changes in total output are shown, in relation to changes in man hours and in output per man hour [items (4) and

(8)]. Indexes of output per man hour are a measure of true productivity,[14] far more accurate, of course, than is a measure of output per person under conditions marked by changing hours of work.

The advance of 10 per cent in output per man hour in the first early spurt was in some degree a cause, in greater degree a result, of the notable increase in total output. Increased market demand made possible an increase in productivity, an increase in its turn facilitated by earlier improvements in equipment, in technique and in the quality of labor. In the twenty-two months that followed this pronounced gain in productivity, output per man hour increased approximately 1 per cent.[15] No further change in average output per man hour occurred during the ten months following the termination of NRA. The figures defining net change, over the entire period of recovery, show a rise of 58 per cent in volume of production, an advance of 11 per cent in output per man hour.

[14] It is convenient to measure industrial productivity on a man hour basis. This is not to be taken to mean that changes in productivity are due exclusively, or even primarily, to the human factor in production. Mechanical equipment may be a more important factor in changing productivity than human skill or intensity of application.

[15] This, of course, is an average figure, behind which there lie large and small productivity losses in certain industries, gains in others. Indeed, the fact should be emphasized that any such analysis as this, which necessarily runs in terms of averages, must ignore the fortunes of individual industries. At times of extreme change there are bound to be wide diversities of fortune. An account that included many industrial case histories would reveal the details of the changes affecting the industrial structure in this recession. But we content ourselves here with the general tendencies that dominated the period, recalling only that many plants and industries followed distinctive courses of their own.

TOTAL WAGE DISBURSEMENTS OF MANUFACTURING INDUSTRIES, AND ELEMENTS OF THE TOTAL

We turn to a survey of wage disbursements during the recovery, viewing these, first, from the point of view of wage recipients. Changes in the aggregate and in two of its elements during the several phases of recovery are defined by items (9), (5) and (10) of Table 41.

Total wage disbursements expanded during all three periods, the relative advance in the second period being materially greater than the gains of the pre-NRA and post-NRA phases. Increases in the number of wage earners and in average earnings per wage earner contributed, during all phases of recovery, to the expansion of the aggregate wage bill.

More light is thrown on the changes in wages and earnings during these periods by a somewhat different division of elements. Total wage disbursements may be considered as the product of the number of hours worked and the average wage per hour. Analysis into these elements, which appear as items (4) and (11) in Table 41, makes it possible to follow changes in wage rates, and to determine their relation to fluctuations in total wage disbursements.

We find quite diverse changes during the three periods compared. The pre-code advance of 27 per cent in the aggregate earnings of manufacturing labor was accompanied by a sharp rise in total man hours worked (31 per cent), and by a drop of 3 per cent in the average hourly wage. In the second period, characterized by operation under new wage provisions, with only a minor change in volume of production, we find a slight increase in total man hours worked, an advance of 40 per cent in average hourly wages. Here was a new factor at work in a period of revival, with definite wage regulations increasing hourly rates at a much earlier stage

than was to be expected from the usual processes of revival. The net effect was to increase total wage disbursements 42 per cent between June–July 1933 and April–May 1935, although production advanced but 2 per cent and employment 1 per cent. During the ten months that followed the end of code operations employment rose 7 per cent, and average hourly earnings remained constant. Over the entire period of recovery we have a pronounced advance in total wages paid, a considerable rise in man hours worked and a notable increase in hourly rates of pay.

It is desirable to trace some of the economic accompaniments of these widely different means of achieving the same result, i.e., a given gain in the aggregate wages disbursed to manufacturing labor. Certain of these consequences may be followed by comparing changes in wage disbursements [item (9) of Table 41], with changes in total volume of production [item (2)], and in labor cost per unit of product [item (12)].

The increase of 27 per cent in the total wage bill of manufacturing industries during the period of pre-code expansion may be viewed as the net resultant of a gain of 45 per cent in number of units produced and a decline of 12 per cent in average labor cost per unit. Thus, although the average hourly wage dropped only 3 per cent, and average earnings per wage earner increased 10 per cent, the labor cost per unit fell 12 per cent. This resulted, of course, from a gain of 10 per cent in output per man hour. Such reduction of an important element of production costs worked definitely towards the correction of the great disparity between the prices of raw materials and of manufactured goods existing at the low point of the depression.

The advance of 42 per cent in total wage disbursements during the code period resulted from two quite different types of change in the component elements. The number of units produced increased only 2 per cent, while average

labor costs, per unit of product, rose 39 per cent. Increasing production and falling labor costs accompanied the first rapid gain in the total rewards of manufacturing labor. A practically constant volume of production and sharply rising labor costs accompanied the advance in aggregate payments to labor that occurred in the period of operation under the codes.[16] Wage disbursements in the post-NRA period continued to advance. It is significant that no change in labor costs per unit occurred during this period. For the recovery as a whole, to February–March 1936, increases of 22 per cent in labor costs per unit and 58 per cent in number of units produced contributed to an advance of 92 per cent in total wages paid.

In interpreting these figures and in comparing the pre-code and code periods we must allow, again, for the influence of factors not connected with code administration. A sharp drop in labor costs per unit of product was to be expected, during the first spurt of revival, as an accompaniment of the pick-up from the very low level of activity prevailing in February 1933. The situation in mid-summer 1933 offered no such potentialities of sudden reduction in operating costs, even though all working conditions had remained unchanged. On the other hand, had working conditions remained unchanged, the first reduction of 12 per cent in labor costs would not have been followed by an advance of 39 per cent.[17]

[16] This measurement of advance in labor costs is subject to at least two types of bias. It is probable that the larger establishments in the sample from which data on pay rolls are secured conformed more closely, on the whole, to code regulations than did the smaller establishments. This would tend to make the measurement of labor costs somewhat higher than it would be with complete coverage. On the other hand, it is known that there is a negative bias in the reported pay roll statistics, arising from the use of a constant sample. Such bias would tend to lower the measure of labor costs. These errors, if present, tend to offset one another.

[17] The apparent advance of 39 per cent in average labor cost per unit of product in American manufacturing industries between June–July 1933 and

SUMMARY OF THE CHANGES OF RECOVERY IN MANUFACTURING INDUSTRIES

The three years from February–March 1933 to February–March 1936 were marked by a curious combination of movements in the operations of manufacturing industries. Physical output and gross income increased during each of the periods we have distinguished; the sharpest spurts came in the pre-code period. The great gain in productivity came also in the pre-NRA period. Thereafter output per man hour advanced slightly, output per worker declined. Total employment (man hours) advanced notably in the first period, remained almost constant under the codes. On the other hand, the greatest advances in number of wage earners employed, wage disbursements and average earnings per employed worker came during the period of code operation. Average hourly wages and labor costs per unit of product declined in the pre-code period, rose by approximately 40 per cent under the codes. Average selling prices of manufactured goods rose prior to and during the stage of code operation, declined slightly after the termination of the codes.

It is clear that certain tendencies of the first period were checked or reversed during operation under the codes. Physical output increased by a bare 2 per cent in twenty-two months of NRA. Evidence of internal difficulties, during this period, in the form of retarded productivity and advancing

April–May 1935 reflects, in part, the abnormal conditions prevailing in midsummer 1933, after the first spurt of revival. This figure is useful for comparative purposes, but is not to be taken as an accurate measure of changing industrial efficiency. More significance attaches to the measure defining the change in average labor cost per unit over the period from February–March 1933 to February–March 1936. This net advance of 22 per cent, over a period that includes the material reduction of labor costs during the first four months, represents a notable departure from the typical movement of recovery.

labor costs, adds to the darkness of the picture. And yet, throughout the period of recovery, gross income advanced, wage disbursements continued to increase, earnings per employed worker rose, and the number of workers on pay rolls continued to increase. Purchasing power was being disbursed in ever-expanding volume, despite the apparently adverse conditions indicated for the second period by the various records of physical production, productivity, and labor costs. Here were strangely conflicting movements. But we shall have a better perspective on these shifts when we compare them with changes during the preceding recession and during earlier periods of business revival.

RECOVERY MOVEMENTS IN RELATION TO A PRE-RECESSION STANDARD

Any economic recovery is closely related to the preceding period of recession. That recession must condition the recovery at many points and vitally affect its character. The exceptional gravity and extent of the recession in American business between 1929 and early 1933 cannot be ignored in surveying the changes brought by recovery. For this reason we supplement the survey of changes during the phase of recovery by a summary account of these changes viewed against a pre-recession base. Measurements are given in Table 42. (Certain of the series given in Table 41 do not appear in Table 42. Where measurements for the longer period could not be considered accurate, in detail, it appeared desirable to restrict statements to general terms and not to cite specific figures.)

Shifting the standard of reference to a pre-recession base has one immediate effect, to reduce the apparent magnitude of the shifts of recovery. For the recession carried most economic series to such low levels in the winter of 1932–33 that

TABLE 42

RECESSION AND RECOVERY IN AMERICAN MANUFACTURING INDUSTRIES, 1929–1936

	June–July 1929	*February–March 1933*	*June–July 1933*	*April–May 1935*	*February–March 1936*
			(current dollars)		
Gross income and its elements					
1. Gross income	100	34	53	62	66
2. Production (physical volume)	100	49	71	72	77
3. Selling price of products (average)	100	69	75	86	86
Production and its elements					
2. Production	100	49	71	72	77
5. Wage earners employed	100	57	65	77	79
7. Output per wage earner	100	86	109	94	97
Wage disbursements and elements					
9. Wage disbursements	100	35	45	64	68
5. Wage earners employed	100	57	65	77	79
10. Earnings per wage earner (average)	100	61	69	83	86
11. Average hourly wage	100	78	76	103	104
2. Production	100	49	71	72	77
12. Labor cost per unit of product (average)	100	71	63	89	88
			(dollars of constant purchasing power)		
Gross income and its elements					
1. Gross income [1]	100	54	75	75	80
2. Production (physical volume)	100	49	71	72	77
3. Selling price of products (average) [1]	100	111	106	104	104
Wage disbursements and elements					
9a. Wage disbursements [2]	100	49	61	77	80
5. Wage earners employed	100	57	65	77	79
10. Real earnings per wage earner (average) [2]	100	86	94	100	101

TABLE 42 (*cont.*)

RECESSION AND RECOVERY IN AMERICAN MANUFACTURING INDUSTRIES, 1929–1936

	June–July 1929	*February–March 1933*	*June–July 1933*	*April–May 1935*	*February–March 1936*
	(dollars of constant purchasing power)				
11. Average hourly wage [2]	100	108	103	124	122
9b. Wage disbursements [1]	100	56	63	77	82
2. Production	100	49	71	72	77
12. Labor cost per unit of product (average) [1]	100	114	89	107	106

[1] The index number of wholesale prices constructed by the National Bureau of Economic Research was used as a deflator.

[2] The index of the cost of living of industrial workers constructed by the National Industrial Conference Board was used as a deflator.

the succeeding rises, in percentage terms, run into relatively high figures. On a pre-recession base the percentage changes are much less pronounced.

In summary, the situation as of February–March 1936, with reference to the situation existing in June–July 1929 was marked by the following features:

The gross income of manufacturing industries had been reduced 34 per cent in current dollars, 20 per cent in dollars of constant purchasing power, at wholesale. The physical volume of manufacturing production was 23 per cent below the 1929 standard. Per unit prices were lower, but the average per unit purchasing power of manufactured goods in wholesale markets was higher. Relatively to other goods, commodities of this type cost more, per unit, than in 1929.

The actual volume of manufacturing employment, measured in man hours, had been reduced about two-fifths and the working force had been reduced one-fifth.

Industrial productivity, per wage earner employed, had declined slightly. Productivity per man hour had risen. The

gain may be estimated at something more than 25 per cent, scored during the period of recession and in the first spurt of revival.

The aggregate purchasing power of manufacturing labor was some 20 per cent lower. The purchasing power of the earnings of each employed worker stood just about at the 1929 level. The purchasing power of an hour's wage (i.e., the real hourly wage) had increased approximately 22 per cent.

The total wage bill of manufacturing industries, measured in dollars of constant purchasing power at wholesale, was approximately 18 per cent lower. Average labor cost per unit of goods produced had risen approximately 6 per cent (cost being here measured in terms of the same constant value standard).

It is apparent from these figures that the recovery in American manufacturing industries, up to the spring of 1936, had fallen short of restoring the pre-recession level of gross income, of production, of employment, or of aggregate purchasing power of labor. Industrial productivity and real wage rates on a man hour basis were much higher than before the recession, nominal wage rates were higher, and real labor costs per unit of product were somewhat higher.

But we need other criteria, in appraising the shifting movements of the current recovery. Earlier periods of business expansion furnish useful standards of reference.

ECONOMIC CHANGES IN MANUFACTURING INDUSTRIES DURING FIVE PERIODS OF BUSINESS EXPANSION, APPROXIMATELY EQUAL IN RESPECT OF DEGREE OF RECOVERY

A comparison of manufacturing operations during different periods of business expansion may be expected to disclose some of the distinctive features of the current movement. It is true that there exists no fixed schedule of recovery, to

which business movements always conform, but something of the nature of a common pattern is found in the cyclical fluctuations of the economic system. Some of the characteristics of this pattern, and distinctive deviations from it, are revealed by the series of measurements presented in this section.

Various modes of comparison are possible in any such survey. For the present purpose it seems desirable to trace the movements of important economic series over periods of expansion marked by approximately equal degrees of increase in the physical output of manufacturing industries. This magnitude, as averaged for the months of December 1934 and January 1935, was 37 per cent greater than at the low point of February–March 1933.[18] It is pertinent to inquire how the changes in manufacturing industries during this period, with respect to employment, productivity, labor costs, etc., compared with corresponding changes during earlier periods of equal increase in volume of output.[19] We should note that in concentrating attention upon the operations of manufacturing industries we ignore numerous economic factors—such as monetary and credit conditions, rela-

[18] Advances of approximately equal magnitude could not be secured for the three preceding revivals, if the record were carried through 1935. Since we are interested in operating changes accompanying similar advances, we restrict the survey of recent changes to the movements up to January 1935.

[19] If we compare, with respect to changes in aggregate production, periods of business recovery widely separated in time, error may be introduced into our conclusions by the changing character of the elements entering into the aggregate. Different industries, marked by important differences of cyclical behavior, may dominate a national economy at different times. These dominant industries would place their own impress on the aggregate into which they enter. But over fifteen years no great changes occurred in the relative importance of elements entering into aggregate manufacturing production, in the United States. The incidence of recovery may, of course, be different, at different times, but this is a condition affecting all comparisons of this sort, in which aggregates of any kind are used.

tions among elements of the price structure, saving and investment—which condition the course and character of recovery. Our interest, however, is not in the economy at large, or in the full complex of circumstances that shape a business revival. It is in a particular segment of the total, and in the internal relations among the elements of this segment. These relations will not be unaffected by external developments, but such developments are of secondary importance in the present comparison.

In this comparison no attempt is made to introduce corrections for seasonal movements. Accurate indexes of seasonal variation are not available for all the series. Moreover, it is known that in important industries the customary seasonal pattern has been modified in recent years. For this reason, and because the cyclical changes here in question are of much greater magnitude than the seasonal, it seems advisable to utilize the uncorrected records. Accurate adjustment for seasonal swings would modify the picture in detail but not in fundamental respects.

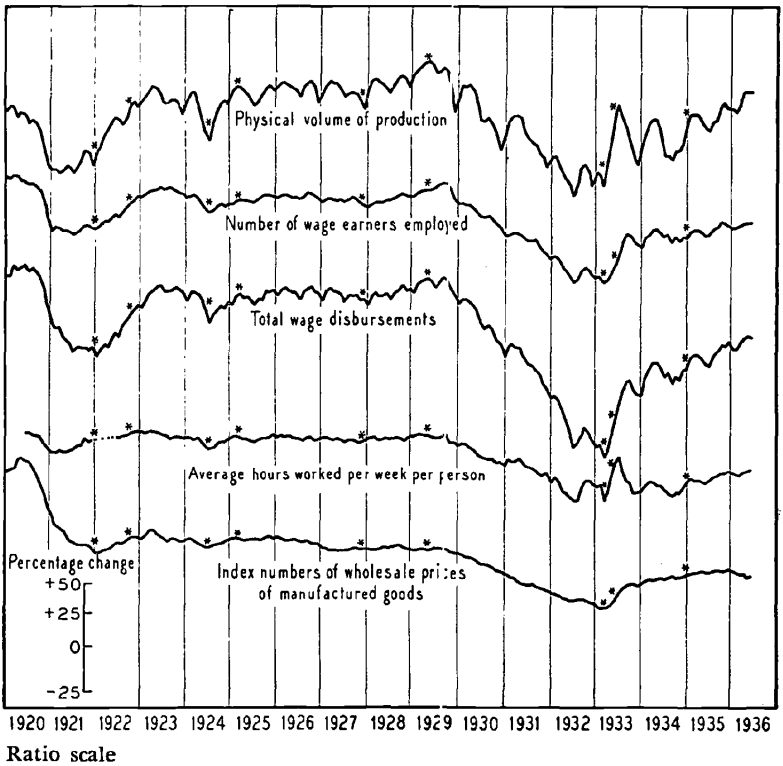
We may enhance the value of this survey by utilizing two different sets of figures for the most recent recovery. The early spurt of 1933 brought an increase in volume of output well in excess of 37 per cent. The closest possible approach to that figure is provided by the period from February–March 1933 to May–June 1933, during which the volume of manufacturing production increased 39 per cent. The changes of this phase may be compared with those of the period February–March 1933 to December 1934–January 1935, as well as with those of the recoveries that began in 1921, in 1924, and in 1927. The period of the first rise, in 1933, is short, and therefore the changes must not be looked upon as resulting from a major technical revolution. They are significant, however, as regards the actual operating condi-

tions of industry, and the relation of currently-expended effort to current outlay and current returns.

As in the preceding section we shall deal with certain major series and constituent elements of each series. The measurements appear in Table 43. The basic series are presented graphically and the dates to which the entries in Table 43 relate are indicated in Figure 13, in order that the nature

FIGURE 13

MOVEMENTS OF SELECTED SERIES RELATING TO AMERICAN MANUFACTURING INDUSTRIES, 1920–1936



Ratio scale

* Asterisks mark the terminal dates of the five periods of recovery analyzed in the text.

of the measurements to be compared may be clear. Data are picked from their setting for the purpose of the quantitative comparison, and it is proper that the reader see what this setting is in each instance.

It is obvious that although the periods of business expansion here compared cover equal degrees of recovery, when physical output of manufactured goods is the yardstick of recovery, they do not cover equal proportionate parts of business cycles. Phases of revival and expansion vary in amplitude and duration, as do business cycles themselves. In studying certain technical aspects of business cycles it is desirable to isolate identical cyclical segments. But interest attaches, also, to the comparison of cyclical movements accompanying given degrees of increase in volume of production.[20]

The items in Table 43, for different periods of recovery, may be compared in detail by the reader. Certain general conclusions based upon the above evidence, and other data, are given in the final section of this chapter. At this point we may be content with a brief summary of the main points revealed by that table.

In respect of the attributes here studied the sharp initial recovery of 1933 appears to have conformed to the pattern of earlier revivals, a pattern that is strikingly repeated in the first four of the five periods covered. But the measurements

[20] Reference has been made to the exceptional severity of the recession of 1929–33, and to the fact that the relative changes of recovery are affected by the severity of the earlier decline. It is to be expected that recoveries, following recessions of varying magnitudes, will differ, in some respects. But we do not know how the pattern of recovery is affected by the preceding recession. The reader will bear in mind the differing magnitudes of the recessions preceding the phases of expansion to which the measurements in Table 43 relate. It will be useful to recall that the volume of manufacturing production declined approximately 27 per cent prior to the 1921 recovery, 26 per cent prior to the 1924 recovery, and 13 per cent prior to the 1927 recovery, as compared with a drop of about 50 per cent from 1929 to 1933. The price drop of 1920–21 exceeded that of 1929–33.

TABLE 43

CHANGES IN MANUFACTURING OPERATIONS DURING FIVE PERIODS OF BUSINESS EXPANSION APPROXIMATELY EQUAL IN DEGREE OF RECOVERY

	Percentage change from				
	Dec. 1921–Jan. 1922 to Sept.–Oct. 1922	*June–July 1924 to Feb.–March. 1925*	*Nov.–Dec. 1927 to April–May 1929*	*Feb.–March 1933 to May–June 1933*	*Feb.–March 1933 to Dec. 1934–Jan. 1935*
Gross income and its elements					
1. Gross income	+42	+46	+31	+46	+69
2. Production (physical volume)	+33	+36	+31	+39[1]	+37
3. Selling price of products (average)	+7	+7	0	+5	+23
Employment and its elements					
4. Total employment (man hours)	+19	+14	+13	+21	+23
5. Wage earners employed	+16	+7	+9	+8	+31
6. Working hours per person (average weekly)	+3	+7	+4	+12	—6
Production and its elements					
2. Production	+33	+36	+31	+39[1]	+37
5. Wage earners employed	+16	+7	+9	+8	+31
7. Output per wage earner (average)	+15	+27	+20	+29	+5
4. Total employment (man hours)	+19	+14	+13	+21	+23
8. Output per man hour (average)	+12	+19	+16	+15	+11

Wage disbursements and elements					
9. Wage disbursements	+24	+14	+14	+16	+65
5. Wage earners employed	+16	+7	+9	+8	+31
10. Earnings per wage earner (average)	+7	+7	+5	+7	+26
4. Employment (man hours)	+19	+14	+13	+21	+23
11. Hourly wages (average)	+4	0	+1	—4	+34
2. Production	+33	+36	+31	+39[1]	+37
12. Labor cost per unit (average)	—7	—16	—13	—17	+20

[1] The index of manufacturing production of the Board of Governors of the Federal Reserve System shows an increase of 43 per cent from February–March 1933 to May–June 1933. Correcting for bias due to the heavy weight given to semi-finished goods in this index, we secure the figure of 39 per cent given in the table. For a general note on this procedure see Appendix VIII-A.

of net change from early 1933 to early 1935 depart appreciably from the customary pattern of business revival. The notes that follow relate to the net movements of the period from February–March 1933 to December 1934–January 1935.

This period brought a greater increase in gross income than did equal degrees of recovery, in physical terms, in earlier revivals. A much more rapid rise in per unit selling prices accounted for the greater increase in gross income.

The number employed increased much more rapidly. Average hours worked per person decreased; earlier recoveries were marked by increases in average hours worked.

Output per worker advanced only slightly. Substantial increases had marked earlier recoveries. The recent increase in volume of production was effected primarily through the employment of more workers.

The net gain in output per man hour compares favorably with earlier advances. (The gain in the recent period was effected, it has been noted, during the first four months of recovery.)

Total wage disbursements, earnings per wage earner and number employed increased much more rapidly than in earlier revivals.

Earnings per hour increased much more rapidly than in earlier periods of revival.

The total wage bill of manufacturing industries and average labor cost per unit of goods produced increased much more rapidly than in earlier revivals.

It is desirable that we supplement these comparative measurements with others in which some account is taken of changes in the standard of value. A rise of 20 per cent in the average selling prices of manufactured goods will have one meaning when the general level of prices remains constant, a quite different meaning when the general price level falls 20 per cent. So, also, a given gain in aggregate pay rolls will have one meaning when living costs remain constant,

TABLE 44

CHANGES IN MANUFACTURING OPERATIONS DURING FIVE PERIODS OF BUSINESS EXPANSION APPROXIMATELY EQUAL IN DEGREE OF RECOVERY

VALUE AND PRICE SERIES CORRECTED FOR CHANGES IN THE VALUE OF MONEY

	Percentage change from				
	Dec. 1921–Jan. 1922 to Sept.–Oct. 1922	*June–July 1924 to Feb.–March 1925*	*Nov.–Dec. 1927 to April–May 1929*	*Feb.–March 1933 to May–June 1933*	*Feb.–March 1933 to Dec. 1934–Jan. 1935*
Gross income and its elements					
1. Gross income [1]	+32	+33	+32	+35	+29
2. Production (physical volume)	+33	+36	+31	+39	+37
3. Selling price of product (average) [1]	−1	−2	+1	−3	−6
Wage disbursements and elements					
9a. Wage disbursements [2]	+27	+12	+18	+15	+46
5. Wage earners employed	+16	+7	+9	+8	+31
10. Earnings per wage earner (average) [2]	+9	+5	+8	+6	+11
4. Total employment (man hours)	+19	+14	+13	+21	+23
11. Hourly wages (average) [2]	+7	−2	+4	−5	+19
9b. Wage disbursements [1]	+15	+5	+15	+7	+26
2. Production	+33	+36	+31	+39	+37
12. Labor cost per unit (average) [1]	−14	−23	−12	−23	−8

[1] For the three earlier periods the index of selling prices of manufactured goods is that of the U. S. Bureau of Labor Statistics. The all commodities index of wholesale prices of that Bureau was used in deflating all series into which these prices enter. For the last two periods the index of selling prices of manufactured goods is that of the National Bureau of Economic Research. The National Bureau's general index of wholesale prices was used in deflating the series into which the prices of manufactured goods enter.

[2] The index of the cost of living of industrial workers constructed by the National Industrial Conference Board was used throughout as a deflator.

and a different meaning when living costs are rising rapidly. No single instrument, suitable for correcting all our value series for changes in the value of money, is available. However, by using a general index of wholesale prices in deflating certain series and an index of living costs among industrial wage earners for other series, we may approximate the measurements we desire (Table 44).

It is apparent from a comparison of Table 44 with Table 43 that certain distinctive features of the recovery of 1933–35 have been due entirely to the more rapid rise of general prices. The apparent advantage of the more recent recovery in respect of per unit gain in the selling prices of manufactured goods is removed, when account is taken of changing monetary values.[21] So, also, the gain in the gross income of manufacturing industries, which was higher for the recent period than for any of the earlier periods, when current dollars were the standard of value, becomes the lowest of the figures compared when correction is made for changing monetary values.

Recent advances in wage disbursements and in the rewards of labor remain substantially above similar gains during earlier periods of recovery, after full account is taken of changing living costs. The total purchasing power of manufacturing labor increased 46 per cent between the low point of early 1933 and the beginning of 1935. The nearest approach to this figure came in the 1921–22 recovery, when pay rolls, corrected for changes in the cost of living, ad-

[21] The 6 per cent loss in per unit worth of manufactured goods between February–March 1933 and December 1934–January 1935 is to be interpreted with reference to the base from which the change is measured. At the low point of early 1933 manufactured goods enjoyed a much greater relative advantage than in any of the three preceding depressions. Reduction of this advantage was the more imperative, therefore, with reference to the conditions of general recovery.

vanced 27 per cent. Comparison of the entries for the last two periods shows that the major part of the recent gain of 46 per cent came after mid-summer, 1933. Reference to the measurements relating to average real hourly wages shows that the novel factor in this gain was a sharp increase in real hourly rates of pay (i.e., money rates corrected for living costs). The rise of 19 per cent in these rates, from 1933 to 1935, stands in notable contrast to the narrower movements of earlier revivals.

If we may measure changes in the purchasing power of the manufacturer's dollar with reference to changes in the general level of wholesale prices, and deflate total pay rolls accordingly, we have the corrected wage disbursement figures given as item (9b) of Table 44. In dollars of constant purchasing power at wholesale the wage bill of manufacturing industries shows an advance of 26 per cent over the period of recovery in 1933–35. This is distinctly higher than the advances during earlier revivals marked by roughly equal increases in the volume of manufacturing production. The explanation is found in the measurements of changing labor costs, per unit of product. In terms of the same constant dollars, these costs dropped 8 per cent from 1933 to 1935, as compared with drops of from 12 to 23 per cent in earlier recoveries.

Perhaps the most significant comparisons to be made, among the measurements in Tables 43 and 44, are those relating to the changes from February–March 1933 to May–June 1933 and from February–March 1933 to December 1934–January 1935. The actual degrees of recovery were nearly the same; the bases from which changes are measured are identical. It is reasonable to assume that the differences between the two sets of measurements are due to new factors introduced into the operations of manufacturing industries

after June 1933. The most important of these new factors were those connected with the industrial codes.

Summary: Industrial Productivity, Manufacturing Margins and Selling Prices

The bottom of the depression found production and employment in manufacturing industries unprecedentedly low. The problems of readjustment brought by the general decline of prices during the preceding four years were acute in these industries. Various factors impeded rapid adaptation to a new set of operating conditions. Heavy investment in capital equipment at a price level much higher than that prevailing after the recession was one of the most important. At the low point of the depression overhead costs, labor costs and selling prices were relatively high in manufacturing industries. The purchasing power of all those drawing incomes from these industries had been materially reduced. Material costs, however, were low, and productivity had increased during the four years of recession. If recovery in volume could be effected, prompt improvement in other respects could be expected. But this recovery in volume was in part conditional upon correction of certain of the adverse price relations that had developed during the recession. In particular, a substantial advance in raw material prices, relatively to the prices of manufactured goods, would provide a stimulus to the buying power of primary producers and would help to restore the volume of intergroup trade.

The first part of this survey dealt with the relative changes of prices among raw materials and manufactured goods during recovery. Material reduction of the wide margin separating the prices of these two groups of commodities took place during the first five months of recovery. There were some variations in the degree of change occurring among different

classes of raw and of processed goods, but with one minor exception the moves towards pre-recession and pre-War trading relations were considerable. During the ten months that followed this correctional movement was checked and, except among mineral products, was rather sharply reversed. The summer months of 1934, which were marked by particularly adverse conditions in farming areas, brought a resumption of the movement towards earlier price relations. For raw producers' goods as a class a considerable net gain had been effected by the early summer of 1936, but the differential price advantage of manufactured goods remained substantial by standards of 1929, and even greater by 1913 standards.

Materials of another sort were utilized in tracing a variety of movements affecting the internal operating conditions of manufacturing industries during the most recent recovery and earlier phases of revival. It was found that the advance of the pre-code period, from February–March 1933 to June–July 1933, definitely followed the pattern of earlier periods. Primary emphasis was on production as a means of expanding income, profits and the returns of labor. Production advanced more rapidly than selling prices. Production advanced more rapidly than the number of persons employed, and productivity per worker increased. Production advanced more rapidly than number of man hours worked, and output per man hour increased. Production advanced more rapidly than wage disbursements, and labor cost per unit of product declined. Expanding production was a major factor in advancing gross income.

With respect to the purchasing power of labor, expanding production again played a dominant part. Labor costs per unit of output declined, with rising volume augmenting the total wage bill. Time rates for labor held practically constant, during revival; increasing man hours of employment oper-

ated as the active factor in the expansion of aggregate returns. Total employment (man hours) rose more rapidly than the number of persons employed; hours of employment per person increased.

Rapidly increasing production and more slowly rising prices contributed to a sharp advance in gross income. This meant, although present records do not bear on this point, immediate increases in profits, in the aggregate.

These were the conditions accompanying a revival of the traditional type. There is, of course, no reason to accept the pattern of earlier revivals as a criterion to which recovery from the depression of 1931–33 should necessarily have conformed. This was a graver depression than those we had known before; it differed in character as well as in degree from similar periods of economic stagnation in the past. Moreover, the periods of activity that were launched by these earlier revivals were marked by important economic as well as social defects. There is nothing sacred about the standard defined by these precedents. Yet, in default of other standards, we must get from them such information as we may concerning the operating conditions of this little-understood industrial machine of ours.

The recovery of 1933–36 is differentiated from earlier revivals by a reversal of the traditional pattern that may be dated, it appears, from the general adoption of industrial codes that began in mid-summer, 1933. Of course, it is not fair to conclude that the codes alone accounted for all the reversals we have noted. Many circumstances affected the economic changes of these disturbed months. But it is a just assumption that the new industrial environment created by the codes had an immediate effect upon the internal operating conditions defined by the various ratios presented in earlier sections. This assumption is strengthened by the fact that certain of the dominant tendencies of the pre-code

period were again manifest in industrial operations after the termination of the codes.

The outstanding feature of the period of operation under the codes lies in the apparent reduction of emphasis on production and industrial productivity as a means of swelling gross income and increasing the aggregate return of labor. Rising prices with a practically constant volume of production marked this period. The productivity of manufacturing industries (as measured in output per man hour) showed a net gain of 1 per cent after twenty-two months of operation under the codes, as contrasted with an advance of 10 per cent during the preceding four months. Too much weight should not be placed upon this development, for the factors involved are complex, and the reasons for changes in productivity are seldom clear. The sharp increase in productivity per man hour during the pre-NRA spurt probably represented almost a full realization of the potential advantages existing at the low point of the depression. A subsequent check does not provide definite evidence of technical or organizational weakness, or of human inefficiency. It is fair to conclude, however, that the new conditions existing after mid-summer 1933 did not provide a stimulus to enhanced industrial efficiency.

An increase in the aggregate purchasing power of labor was one of the objectives of the recovery program, and such an increase was very definitely won. Over some twenty-two months, while the physical volume of manufacturing production was increasing 37 per cent, aggregate wage disbursements by manufacturing industries increased 65 per cent.[22]

[22] These figures relate to changes between February–March 1933 and December 1934–January 1935. The percentages of increase in production and wage disbursements become 58 and 92, respectively, if the records are carried to February–March 1936. Since the present figures are given for comparison with movements in earlier revivals, the shorter period is covered.

Equal production increases during the three preceding revivals had brought advances of from 14 to 24 per cent in total wage disbursements. What is here notable is not the degree of increase, however. The fact that wage payments had dropped to excessively low levels in the winter of 1932–33 would lead one to expect a sharper relative advance, with recovery. The distinctive features of the recent rise are found in the relations of wage disbursements to other movements of the recovery period. Labor costs per unit of output increased materially; labor costs per unit of time expended rose sharply. In these respects the latest advance departed most significantly from the traditional pattern of revival.

Adjustment of these various measurements to take account of changes in the level of prices and in living costs alters the general picture somewhat. The rise in selling prices of manufactured goods in the recent recovery disappears when such adjustment is made. The increase in the aggregate purchasing power of manufacturing labor is less pronounced than the increase in wages in terms of current dollars (the actual increase in purchasing power amounted to 46 per cent, however, to the beginning of 1935). Similarly, the perspective is changed and the apparent magnitude of some of the recent changes reduced when the changes occurring during the recovery of 1933–36 are measured against 1929 values, instead of 1933 values. But the characteristic features of the recovery of 1933–36 are clearly discernible, no matter what the standard of reference may be. An apparent check to the advance in industrial productivity after mid-summer 1933, maintenance of a short working week and an exceptionally heavy use of men to maintain a given volume of physical output, a relatively sharp advance in the aggregate purchasing power of labor and notable advances in labor costs per unit of time and per unit of product are distinctive of the recent recovery.

High labor costs were, of course, a necessary accompaniment of a rapid increase in the time rate of wage payment (unaccompanied by an equal gain in productivity) and of a rise in total wage disbursements far exceeding the increase in physical volume of production. The price of an expansion in purchasing power, so achieved, was the exceptional rise in costs we have noted.

Why did this notable rise in hourly wage rates, in aggregate wage payments, and in labor costs per unit of product not lead to a much sharper rise in the selling prices of manufactured goods than that actually recorded? The prices of manufactured goods rose somewhat less rapidly than the general price level between July 1933 and May 1935. (The price level of all commodities at wholesale rose 15 per cent, that of manufactured goods 12 per cent.) This fact is apparently inconsistent with the advancing costs we have noted.[23] The answer, I think, is that the price advantage

[23] If we take account of the relative movements of the prices of raw and processed goods over the entire period from February 1933 to the spring of 1936 definite reductions of the disparities developing during the recession are to be observed. Yet we misread the changes of this period if we fail to note the actual course and timing of these readjustments.

Correction of the disparities existing in February 1933 called for a rise in raw material prices, relatively to the prices of manufactured goods. Between February–March 1933 and June–July 1933 raw materials rose 22 per cent in price, manufactured goods 9 per cent. This was the pre-code period. During the ten succeeding months, from June–July 1933 to April–May 1934, the prices of raw materials rose 8 per cent, the prices of manufactured goods 10 per cent. The earlier ameliorative movements were definitely reversed, during this period of operation under the codes. A new correctional movement took place during the summer of 1934, a movement clearly attributable to the influence of the drought on the prices of farm products. From April–May to August–September 1934 the prices of raw materials rose 10 per cent, the prices of manufactured goods 2 per cent. Thereafter, through the spring of 1936, there was no appreciable change in the relations between the prices of these two groups of commodities.

There was, thus, definite improvement in the relative position of raw materials during the period prior to code enforcement, and during the sum-

already enjoyed by manufactured goods as a result of less severe liquidation during the recession, provided a margin out of which these rising costs could be met without a great additional price rise. The prices of manufactured goods were already high, relatively, and this price advantage, which tended to be nominal rather than real when volume of sales was low, became substantial with an increasing volume of business. The new costs, then, served not so much to advance the selling prices of manufactured goods as to impede a downward adjustment of the real prices of manufactured goods, an adjustment imperatively necessary if the foundations of a lasting recovery were to be laid.* During the forty-three months of recession from July 1929 to February 1933 the prices of raw materials fell 49 per cent; the prices of

mer drought in 1934. When the movements of these two periods are removed, we find price changes working against the downward readjustment of the real per unit value of manufactured goods.

* DIRECTOR'S COMMENT: Other and equally important causes of the failure of these real prices to fall were: the power to sustain prices and restrict output exerted by industry through NRA codes and non-legal monopolistic devices; the relatively large proportion of overhead in manufacturing costs in heavily mechanized industries; the accounting habits which tend to recover all existing overhead even on small volume, thus increasing unit overhead costs; the resistance that large industries are able to offer to capital reorganization or bankruptcy. It cannot be assumed that lower prices would not have been compatible with the existing wage rates if less efficient competitors had been eliminated, if prices had been forced down either by competition or regulation, and larger volume of production had resulted.—George Soule

DIRECTOR'S NOTE: I feel compelled to note my disagreement with much of the above comment and with its implications. I do not wish to carry the discussion too far away from Professor Mills' here and therefore observe only: (1) That in practice, according to my observation—and I should suppose in theory—price reductions are more readily conceded in times of small demand where a large part of costs is indirect and must be met whether or not sales are made than where the cost is more largely a direct cost that need not be incurred unless it is worthwhile to do so; and (2) That I think the comment overrates the effects of the assumed accounting habit.—George O. May

manufactured goods fell 31 per cent. The gain in the real value, that is, in the average per unit purchasing power, of manufactured goods during this period was 11 per cent. In default of a permanent shift in intergroup relations, correction of this condition was essential to the restoration of trade in anything approaching normal volume. Some degree of correction was effected during the period of recovery we have reviewed, but a disparity still existed in 1936. It was this differential advantage existing at the low point of recession,[24] an advantage that became substantial with an expanding volume of production, that made possible the payment of higher labor costs and even made it possible for profits to expand, without an exceptional rise in the selling prices of manufactured goods. But the persistence of the margin that made it possible to meet higher labor costs and to make profits, even though volume of output remained low by normal standards, retarded full expansion of sales and of output and the restoration of employment in customary volume. And in so doing it worked to prevent the restoration of a normal volume of wage disbursements.

In following the notable increases in wage disbursements and in labor costs during the recovery of 1933–36 we should not overlook the severity of the preceding declines. If labor costs be measured in the dollars the manufacturer receives for his products (i.e., if labor costs be deflated by an index of the selling prices, at wholesale, of manufactured goods) we find that in February–March 1936 these costs stood only some 6 per cent above the level of June–July 1929. In the same units, the average selling price of manufactured goods was 4 per cent higher. If labor costs in manufacturing industries were high in 1936, they were high to the extent that

[24] The potential advantage resulting from price relations was rendered much greater by a considerable increase in output per man hour during the recession.

the prices of manufactured goods as a class were high. With respect to the relation of labor cost to the selling prices of manufactured goods, the sharp advance of the period of recovery had done little more than correct for the severe recession that preceded. For labor costs per unit of product had fallen 29 per cent, from June–July 1929 to February–March 1933; the selling prices of manufactured goods had fallen 31 per cent. This means that, with only a minor difference, the aggregate wage bill showed a net decline equal to that occurring in the gross income of manufacturing industries. Wage liquidation paralleled the general drop in gross income, during these four years of recession. In this respect, the recession of 1929–33 stands alone, among recent cyclical declines. For, traditionally, the decline in wage disbursements lags behind the drop in the gross income of manufacturing industries, and labor finds itself, at the bottom of the depression, getting a larger share of the aggregate receipts. This was not true of the 1933 situation.[25]

Of course, the difference between time rates of pay and labor costs per unit of product is to be distinguished, in this analysis. If time rates of pay remain constant when industrial productivity is increasing, labor as a producer gets none of the rewards of higher productivity. (As a consumer, of course, manufacturing labor would gain, if the higher productivity

[25] The comprehensive biennial records available in Census compilations throw light on these changes, during the 1929–33 recession. In 1929 total wage disbursements constituted 16.5 per cent of the gross income of manufacturing industries. By 1931 this percentage had increased to 17.4. This change is in accord with past experience. By 1933, however, the percentage had dropped again to 16.8. Liquidation of wages lagged behind the general process of liquidation during the first two years of recession, but thereafter the reduction of wages was speeded up. By 1933 wage payments constituted only a slightly larger fractional part of the gross income of manufacturing industries than in 1929.

were reflected in lower selling prices.) If labor costs per unit of goods produced remain constant when industrial productivity is increasing, manufacturing labor, as a producer, gets rewards of higher productivity in the form of higher pay. If the real selling prices of manufactured goods fail to fall, at such a time, the benefits of the increased productivity are not being passed on to consumers generally. (Agents of production other than labor are almost certain, of course, to gain, also.)

If we compare February–March 1936 with June–July 1929, we find a notable increase in productivity (probably exceeding 25 per cent per man hour), real labor costs per unit of product somewhat higher than in 1929, substantially higher real rates of pay, per hour of work done, and an actual advance in the real prices at which manufactured goods exchange for other goods. In place of the reduction of real production costs and real selling prices that was to be expected in manufacturing industries, in view of the substantial increase in industrial productivity between June 1929 and March 1936, those costs and prices had advanced. At a time when the strongest considerations relating to general recovery called for lower selling prices, these prices were maintained at levels above those prevailing for commodities in general.

There is some analogy between the situation prevailing in manufacturing industries from 1933 to 1936 and that which prevailed from 1922 to 1929.[26] From 1922 to 1929 profits and overhead charges were maintained at high levels, and the selling prices of manufactured goods failed to decline, to a degree commensurate with the increase in industrial productivity and the fall in labor costs during that period. This

[26] See *Economic Tendencies in the United States,* Ch. VIII.

situation tended to reduce marketings and so contributed to the unstable situation existing in 1929. The rise in time rates of pay and in total wage payments in 1933–36, and the failure of overhead and fabricational costs to reflect the great gain in productivity that had occurred since 1929, helped to perpetuate relatively high prices for manufactured goods. (The fabricational costs which thus remained high were not restricted to labor costs. The fact that labor costs did no more than parallel changes in selling prices, when material costs were relatively low, indicates that other fabricational charges, such as overhead costs, remained on the same high level as labor costs.) The advance in the prices of these goods, at a time when such goods were already over-valued, retarded a needed expansion in the volume of sales. During the decade of the 'twenties a high manufacturing differential (profits are here included with the differential) was a factor in preventing the *maintenance* of a large volume of production and sales. From 1933 to 1936 a high manufacturing differential was a factor in preventing the *restoration* of a large volume of production and sales.

We are far from knowing all the conditions essential to the steady and efficient operation of a modern industrial economy. But experience during the last ten years seems to justify one general conclusion. The immediate passing on to consumers of a major part of the benefit of increasing industrial productivity, in the form of lower prices, contributes directly to the maintenance of industrial operations on a high level and to the raising of the standard of living of the people at large. Action designed to procure for special groups the advantages of increasing industrial productivity, or action tending to decrease industrial productivity and advance costs, runs the grave danger of defeating its own purpose, through setting barriers to the maintenance (or the restora-

tion) of the volume of production and employment that is essential to the general welfare.[27]

[27] The section of this chapter that deals with the operations of manufacturing industries during recovery, and the main parts of the summary, were published as *Bulletin 56* of the National Bureau of Economic Research on May 10, 1935.