Retrospect and Prospect

1920-1936

BY THE DIRECTOR OF RESEARCH

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INCOME ORIGINATING IN NINE BASIC INDUSTRIES 1919–1934

SIMON KUZNETS

Agriculture

Mining

Electricity, Gas and Power

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A NON-PROFIT MEMBERSHIP CORPORATION FOR IMPARTIAL STUDIES IN ECONOMIC AND SOCIAL SCIENCE

Income Originating In Nine Basic Industries, 1919-1934

SIMON KUZNETS

In the study whose partial results are presented in this *Bulletin* Dr. Kuznets is being assisted by Miss Lillian Epstein and Miss Elizabeth Jenks. We are indebted to the United States Bureau of Foreign and Domestic Commerce for being allowed to consult the details of its estimates of national income for 1933 and 1934.

THIS *Bulletin* analyzes some results of the National Bureau's study of the nation's income since 1919. Although the study is still in progress, estimates have been completed for several important branches of the economic system. None can be final until income originating in the other branches has been measured, but it is not expected that the revisions will materially alter the present estimates.

CONCEPTS AND COVERAGE

National income totals may be viewed broadly as measures of the success of the economic system in supplying commodities and services to the aggregate of individuals comprising the nation. The fullfillment of this general task can be defined and measured in various ways. For example, the national income for a given year may be said to represent the net production of the nation, i.e., the total volume of commodities and services produced during the year, minus the raw materials, capital equipment and other economic goods consumed in this production. This concept, used in our earlier study in the field, we designated 'national income produced'.[1] Or, national income may be understood as comprising all payments to the nation's individual members during the year in return for the productive services they rendered. This concept was designated in the earlier study 'national income paid out'. Finally, national income totals may include only commodities and services consumed by individuals during the year, as a rough measure of the welfare derived by the nation's ultimate consumers from the products of the economic system. This concept might be designated 'national income consumed'.

In this *Bulletin* measures are presented for income produced and income paid out in: (1) agriculture, (2) mining, (3) electric light and power and manufactured gas, (4) manufacturing, (5) contract construction (i.e., construction done under contract by construction firms, excluding that done on their own account by enterprises primarily engaged in other activities), (6) steam railroad transportation, (7) other transportation (water, street railways, pipe lines), (8) communication (telephone, telegraph), and (9) trade (wholesale and retail). This classification is governed only in part by the differences in the economic nature of the several industrial branches distinguished; it is also largely predetermined by the limitations of the available data. But it distinguishes the four major branches of the country's commodity-producing system, viz., agriculture, mining, manufacturing and construction; the basic branches of transportation, even though for lack of data motor truck and bus transportation cannot be measured; the combined branches of communication, and of the distributive trades. It omits important branches because the measurements are not yet completed, viz., finance, government, the large body of service industries (private education, amusement, professional services, business services, domestic service, etc.), and all the miscellaneous activities that do not fit easily within any of the industrial divisions mentioned.

For each industry the totals of income paid out, i.e., income payments to individuals rendering service within the industry, either by participating personally in the process

[1] See *Bulletin 49* of the National Bureau, and Senate Doc. 124, 73rd Cong., 2nd Sess., entitled *National Income, 1929-1932* (Washington, 1934).

of production or by investing capital in the industry, are subdivided by major types of payment, such as compensation of employees, withdrawals by individual entrepreneurs, dividend disbursements and interest payments.

Compensation of employees should include not only wages and salaries but also pensions and compensation to employees for injury. Wages and salaries have been estimated for all nine industries; pensions and compensation for injury for only two: steam railroad transportation and communication, since for other industries it was difficult to obtain the pertinent data for years prior to 1929. However, in 1929 the payments for the industries in which these items are omitted in our estimates amounted to only 159 million dollars; the total labor income for these branches was about 29 billion dollars.

Withdrawals by individual entrepreneurs are the least reliable set of estimates, since their measurement implies an analysis of the income flows in that part of unincorporated establishments which is least susceptible to statistical treatment. Accordingly, the absolute value and the movement of this item should be interpreted with especial caution.

For both dividend and interest payments the attempt is to measure only that part which goes to individuals, and to exclude the part that flows from one business enterprise to another. Hence, interest payments include payments on long term debt only, upon the assumption that in the nine industries analyzed interest on short term debt is paid exclusively to banks and other business units. Hence also the amounts of dividend and interest payments shown in our estimates as originating in the several industrial branches are not the gross disbursements, but are only that part which they contribute to the total payments flowing to individuals. For dividends, this item is obtained by subtracting from total dividend disbursements by a given industry all dividends received by it from other industries. A similar correction is made for interest payments on long term debt in electric light and power, steam railroads, street railways and communications. In the other industries, owing to lack of data, only interest receipts on holdings of governmental securities are subtracted. But the assumption is that in these industries, holdings of long term, fixed-interest obligations of other industries are negligible.

In addition to the items discussed under income paid out, income produced includes net business savings or losses. This item is often confused with business profits and losses in the usual meaning of that term; and has currently been interpreted as either an accretion to the industry's stock of capital goods from income currently produced, or as a draft upon the industry's stock of capital goods for the purpose of augmenting income paid out. However, net business savings or losses are computed after payment of dividends and withdrawals by individual entrepreneurs, whereas business profits or losses are usually computed before such deductions. Also, the interpretation of net business savings or losses as accretion from current income to the capital stock of the industry or as diversion from the latter to current income payments is misleading. The measurement of this item, as based on the available data, is conditioned by the rules of business accounting which, in several respects, diverge significantly from the above definition of national income produced. First, the practice of business firms of including profits and losses from sale of assets tends to cause changes in net business savings and losses that have little to do with the difference between the net volume of commodities and services produced and the amount of income paid out. But from the available data adjustment for these profits and losses from sale of assets can be made only since 1929. Second, the practice of business firms of prorating depreciation and depletion charges to the original cost of the capital goods, rather than to their reproduction value, may obviously result in a net business saving or loss that is not a correct measure of accretion to or draft upon the industry's real stock of capital goods, even when this accretion or draft has its source or destination in current income. Third, the practice of business firms of valuing inventories at cost or market, whichever lower, tends during years of declining prices, such as occurred after 1929, to exaggerate the net business loss or reduce net business savings purely as a result of a decline in prices, not of a reduction in the commodity volume of inventories. No adjustment was made in our estimates for these effects of depreciation and depletion charges and revaluation of inventories upon net business savings or losses. Accordingly, net business savings or losses, as measured below, can hardly be interpreted as an accretion to or draft upon the stock of capital goods. Also, income produced is subject to changes that reflect not only fluctuations in the net current value of commodities produced and services rendered, but also variations in the returns from sale of assets, effect of changes in the valuation of inventories, and distortions introduced by the valuation of fixed capital goods consumed.

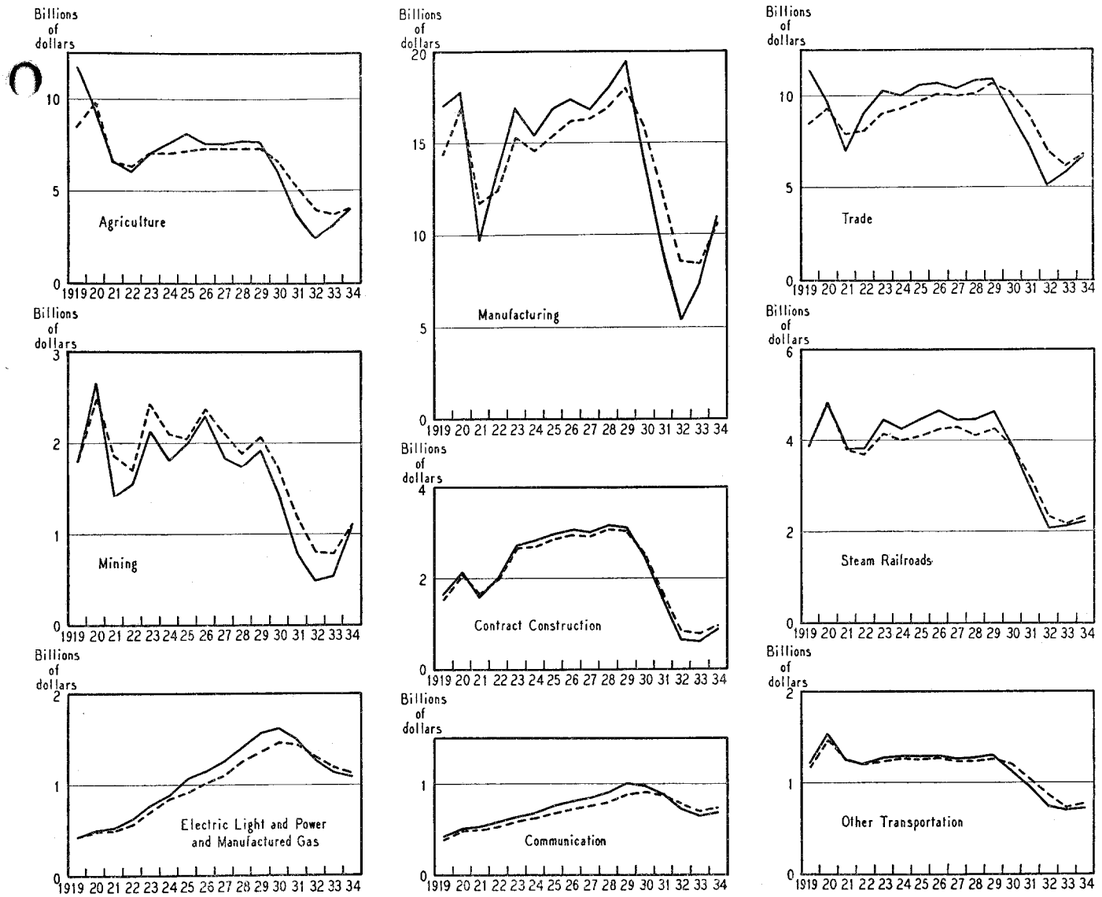
Finally, from both income paid out and produced in each industrial branch two minor types of payment are omitted. First, rents and royalties paid to individuals by the several industries cannot be measured from the available data. Perhaps, net rents, the predominant portion of the combined rents and royalties item, should be treated as return for entrepreneurial activity in real estate, and thus as part of income produced and paid out in that industry, rather than as pure property income such as dividends and interest. Whatever the answer to this controversial question, the amounts involved are but a small fraction of the total: net rents received by individuals in 1929 were estimated at

CHART 1

INCOME PAID OUT AND INCOME PRODUCED

NINE BASIC INDUSTRIAL BRANCHES, 1919-1934

---- Income paid out —— Income produced



4.1 billion dollars out of a total income of over 80 billion. In some industrial branches, such as agriculture or trade, net rents paid to individuals may constitute considerably more than 5 per cent of the total net income, but even in these industries this item is unlikely to affect appreciably the movement of income totals over time.

The second item that could not be treated properly by industrial branches is the net balance of income received by individuals in this country from securities and direct investments in foreign enterprises over the income received by foreigners from securities and direct investments in enterprises domiciled in the United States. The amounts involved are, however, negligible compared with the income from American industries.

AVERAGE VOLUME OF INCOME AND OF ITS CONSTITUENT PARTS

Chart 1 presents annual estimates of income produced and paid out by the nine industrial branches covered in this *Bulletin;* the dollar totals, and their distribution by type of payment are given in Appendix Table 1. Considerable variability among the industrial branches is manifest in the size of the income and in its distribution among such constituent parts as compensation of employees, withdrawals by individual entrepreneurs, or dividends and interest payments.

Table 1 summarizes the relevant information. Manufacturing, trade and agriculture are, in the order listed, the most important industrial branches in respect of the origin

TABLE 1

INCOME PAID OUT AND PRODUCED AND THE ALLOCATION OF THE FORMER BY TYPE OF PAYMENT, ANNUAL AVERAGES FOR BASIC INDUSTRIAL BRANCHES, 1919-1934

INDUSTRIAL BRANCH	ANNUAL AVERAGE, 1919-34 ($000,000's) Income paid out	Income produced	PERCENTAGE OF AVERAGE VOLUME OF NET BUSINESS SAVINGS OR LOSSES[1] TO AVERAGE VOLUME OF INCOME PRODUCED	PERCENTAGE OF AVERAGE VOLUME OF EACH TYPE OF PAYMENT TO AVERAGE VOLUME OF INCOME PAID OUT: Compensation of employees	Withdrawals by entrepreneurs	Dividend disbursements	Interest payments	Dividend and interest payments
1. Agriculture	6,579	6,650	1.1	16.8	77.6	0.0	5.7	5.7
2. Mining	1,779	1,589	—12.0	84.4	1.4	11.9	2.2	14.2
3. Electric Light and Power and Gas	981	1,048	6.4	40.0	0.2	34.0	25.8	59.8
4. Manufacturing	13,960	14,128	1.2	83.9	2.3	12.5	1.2	13.7
5. Contract Construction	2,132	2,152	0.9	82.1	15.8	1.8	0.4	2.2
Commodity Production (1-5)	25,431	25,567	0.5	64.7	22.8	9.2	3.3	12.5
6. Steam Railroads	3,699	3,809	2.9	79.1	0.0	7.3	13.6	20.9
7. Other Transportation	1,154	1,152	— 0.1	80.5	0.4	9.0	10.1	19.1
8. Communication	688	720	4.6	76.7	0.0	17.7	5.5	23.3
Transportation and Communication (6-8)	5,541	5,681	2.5	79.1	0.1	8.9	11.9	20.8
9. Trade	8,863	9,038	1.9	72.3	22.9	4.3	0.5	4.8
Total, nine industries	39,835	40,286	1.1	68.4	19.6	8.1	3.9	11.9

[1] After payment of dividends and withdrawals by individual entrepreneurs.

of total net income in the nine branches; the five commodity-producing branches account for over 60 per cent of this total. Trade gives rise to a larger volume of net income than the combined transportation and communication branches, but this difference would perhaps disappear were truck and bus transportation included.

The amounts of income produced and paid out do not differ appreciably when averaged over a period as long as the one covered. With the qualifications suggested above, a substantial percentage in column 3 of Table 1 would mean a large accumulated accretion from current income to the capital stock of the industry or a considerable draft upon the latter used to augment income paid out. Hence, the large negative percentage for mining and the substantial positive percentage for the electric light and power and manufactured gas industries are striking. In mining this large percentage of net business losses is confirmed by the fact that fixed assets of mining as reported in *Statistics of Income* declined appreciably even before 1929 and may be due partly to the industry's practice of deducting large depletion charges. In the electric light and power and manufactured gas industries the large percentage of net business savings is corroborated by their favorable showing in many other respects, to be commented upon below.

The percentage allocation of income paid out by types of payment shows clearly the well-known differences among the several industrial branches in form of organization and the relative volume of capital and labor employed. In agriculture unincorporated individual undertakings are still the usual form of enterprise, and withdrawals by entrepreneurs constitute a major share of income paid out. Individual entrepreneurs are still important also in contract construction and in trade. In these three industrial branches the share of pure property income is still small compared with the share of direct labor of employees or of the direct labor and investment of entrepreneurs. Individual entrepreneurs either account for minor fractions of the activities of the other six industries or are absent from them; the share of property income, on the other hand, is substantial, especially in the public utilities. In the electric light and power and manufactured gas industries the share of property income is close to 60 per cent of total income paid out—a striking case of large investment of fixed capital and of a relatively small volume of direct labor.

MOVEMENTS OF INCOME TOTALS IN NINE BASIC INDUSTRIES

Adjustment for price changes

The income totals plotted in Chart 1, utilized in Table 1, and given in Appendix Table 1, are in terms of current dollars. They may show rises or declines that are due exclusively or in large part to changes in prices, rather than to changes in the volume of commodities produced and services rendered. By adjusting them for price changes we can see these movements not only in dollar volumes under conditions of a fluctuating price level, but also in terms of a composite of commodities and services valued at fixed prices.

In such a price adjustment we may rule out of consideration the correction of the changes in income totals by a general, overall index of price changes, an index that would reflect prices of all commodities and services exchanged on the innumerable markets of the economic system. In dealing with income produced in an industry we are interested in the commodity total which it represents.

Since the price level of one group of products often moves differently from the general price level, any adjustment of the income total of an industry by a general price index may give a misleading picture of changes in the commodity equivalent of the income produced.

These disparities in the movements of specific price levels necessitate the adjustment of dollar totals by the price changes of the particular group of goods that each represents. Viewed in this light, two types of adjustment are significant. First, we may wish to know for income produced the variations in the volume of commodities and services contributed by each branch to the total of economic goods produced by the nation. Second, for both income produced and income paid out we may wish to know the purchasing power, to the individuals and business establishments attached to each industrial branch, of the income for whose creation they are responsible and which was made available to them in compensation for their activity. In the first case, income produced would be adjusted for changes in the prices of commodities and services *produced* by the industry. In the second, both income produced and income paid out would be adjusted for changes in the prices of commodities and services *purchased* by the individuals and business establishments in a given industry with the net income available to them. The first type might be designated the adjustment for the price changes of the product; the second, the adjustment for changes in its purchasing power.

Both types of adjustment encounter formidable statistical difficulties. That for price changes of the product requires not the usually available prices of the commodities and services produced in the industry, but prices of that part of the product which constitutes the net income. Thus, in adjusting net income produced in agriculture or in mining, we cannot use directly prices of agricultural or mineral products, since a substantial part of the price of each is accounted for not by the net income of agriculture or mining but by payments made by these industries to other industries. What is needed is some price index derived from a comparison of the prices of agricultural or mineral products with the prices of those economic goods which agriculture or mining purchases from other industries and consumes in its productive processes.

Prices of commodities are available and the gross income of some industrial branches may be adjusted for price changes, but a price index specifically applicable to net income produced cannot be derived. The difficulty, however, may be overcome by proceeding upon the assumption that if price relations of all commodities and services and the technical conditions of production are held fixed, the proportion of the industry's *gross* product (when computed so as to exclude intra-industry duplication)[2] that goes into *net* income is constant. Upon this assumption the movement of the net income produced in a given industry, when adjusted for price changes, is represented exactly by an index of the industry's gross physical output, corrected for intra-industry duplication. This method has been adopted below; for the several industrial branches for which indexes of physical volume of product are available this index is taken to represent net income originating in the industry, adjusted for price changes of the product.

The second type of adjustment, that for changes in the purchasing power of the product, encounters still more formidable statistical difficulties. It requires for every industrial branch prices of the various economic goods purchased by the individuals with their net income or by the business establishments with their net business savings. But the only price data available measure changes in a standardized cost of living for urban wage earners and for farmers; and if savings may be interpreted, with some qualms, as the purchase of capital goods, there are approximate price indexes for the latter. Data are not available for the period on prices of goods purchased by groups of the population other than wage earners; nor data that make it possible to differentiate among the expenditure patterns of groups attached to the various industries.

Thus no specific adjustment for changes in the purchasing power of the product can be undertaken in each industry. Nevertheless, it is perhaps better to make such an adjustment on a rough and common basis than to leave the dollar totals completely uncorrected for the striking changes in the purchasing power of the dollar that occurred over the period. In this belief, an index was constructed, as a combination of the cost of living index of urban wage earners (with a constant weight of 9) with the index of prices of capital goods (with a constant weight of 1). This index was applied to the income totals for each industrial branch, and the correction is thus in terms of a hypothetical expenditure pattern that varies neither from year to year nor from one industrial branch to the next.[3]

[2] Intra-industry duplication occurs when in addition to the finished goods turned out by an industry, the total includes also raw materials and semi-finished goods both produced and consumed by it in its productive processes.

[3] This application of the combined index of cost of living and prices of capital goods may appear inconsistent with the statement made above concerning the inadvisability of using an index of the general price level in the adjustment of income totals for specific industrial branches. To some extent such inconsistency is present, and the objections made in connection with the general price index apply also to the index of purchasing power described in the text. But it is clear that the latter is much narrower and more specific than any index of the general price level, since it excludes prices in the vast areas of wholesale commodity transactions, in security and property markets, etc. To that extent the objections to the application of the index of purchasing power, while still present, have less force than they would with respect to an all-inclusive price index.

The results of these two types of adjustment of income totals for price changes are shown in Chart 2. Income produced, rather than income paid out, was corrected for price changes, since the index of physical volume is more comparable with it. In view of the general similarity in the direction of movement between income paid out and produced, the effect of the adjustment for changes in the purchasing power of the dollar is similar in character, if not in relative magnitude, for both.

The indexes of physical volume of output for agriculture, mining and manufacturing are composites of commodity totals, valued at fixed prices; for contract construction, the dollar volume divided by an index of construction costs. The physical volume of output in the other branches is in units of performance, weighted by the average value in dollar terms: for electric light and power and manufactured gas—kilowatt hours of electric energy and cubic feet of gas; for steam railroads—freight ton miles and

CHART 2

INCOME PRODUCED, UNADJUSTED AND ADJUSTED FOR PRICE CHANGES

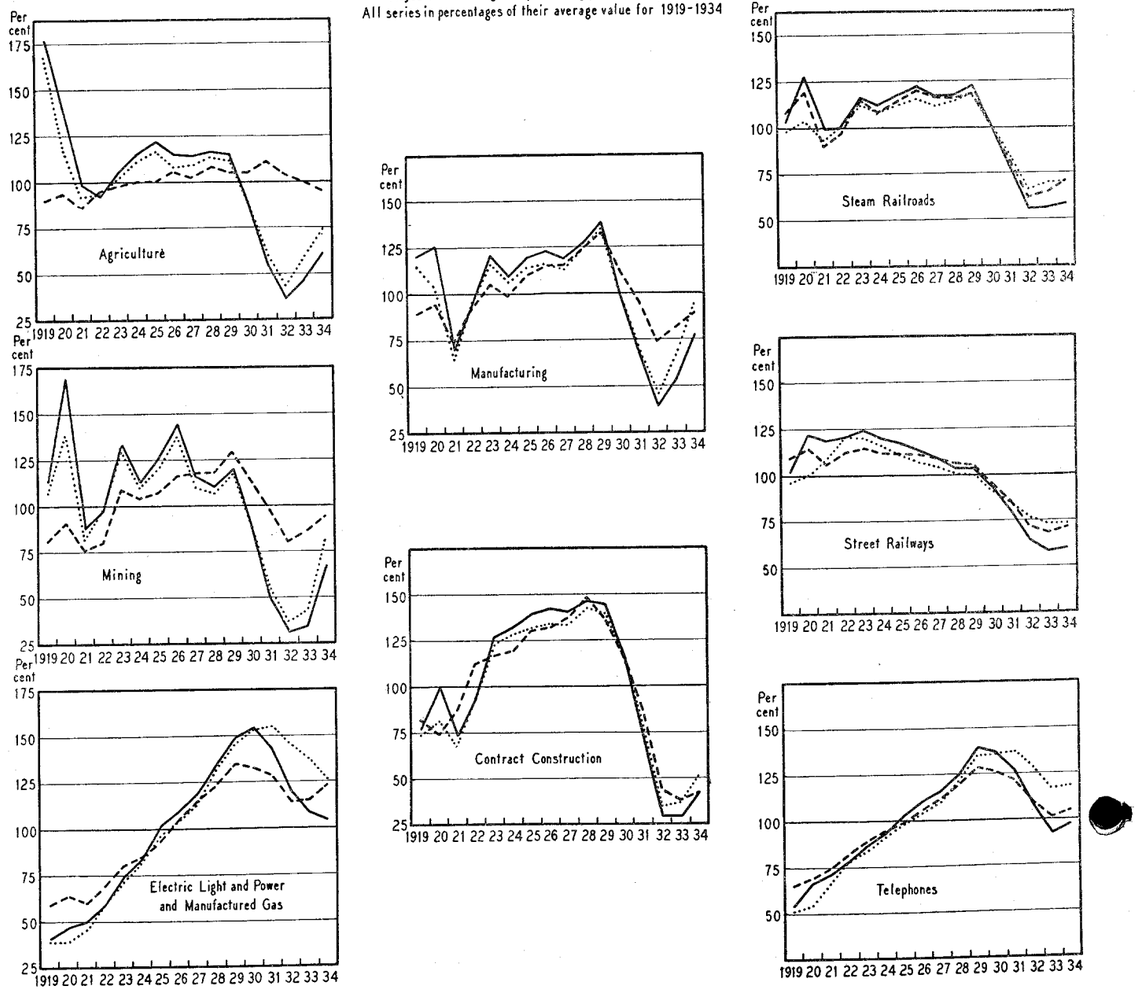
BASIC INDUSTRIAL BRANCHES, 1919-1934

—— Income produced, unadjusted

- - - - Adjusted for changes in prices of the product (physical volume)

····· Adjusted for changes in purchasing power of the product

All series in percentages of their average value for 1919-1934



passenger miles; for street railways—number of passengers carried; and for telephones—number of exchange and toll connections. For each branch covered an attempt was made to obtain indexes of physical output that correct for duplication within the industry. These indexes are measures of only a part of the activity that is reflected more fully in the totals of income produced, in current dollars. Another source of disparity between the dollar and physical volume indexes arises from the effect, mentioned above, of accounting practices upon the determination of income produced. These considerations must be kept in mind in interpreting the comparisons made below between the movement of income produced, in current dollars, and the changes in the physical volume of production.

Cyclical movement

Most income totals in Charts 1 and 2 show both short cyclical oscillations and a long cyclical swing, beginning with a trough in 1921 or 1922, reaching a peak in 1929 or earlier, and declining drastically to another trough in 1932 or 1933. A long-time change over the period as a whole is also observable. With respect to either the cyclical changes, whether during the long swing or the shorter oscillations, or the changes over the period as a whole, there are significant differences in the movements of the income totals among the several industrial branches; and within each industrial branch, between income paid out and income produced, and between income produced, measured in current dollars and adjusted for changes in prices.

Both the annual character of the data and the industrial classification used prevent the income estimates from being a proper basis for an exact study of cyclical changes. On the other hand, these movements are so prominent in the income totals that no description of what these estimates indicate can be presented without first considering the cyclical changes to which they are subject. A clear distinction appears between the long swing, which lasted from 11 to 15 years, and thus accounted for most of the post-War period, and the shorter cyclical oscillations, of which there were as many as four in the income totals for several industrial branches. For both, the amplitude of the oscillation is measured in the same fashion in Table 2. First, the series is converted into percentages of the average value during each observed cycle, measured from trough to trough. Second, the total rise from trough to peak, and the total decline from peak to trough are measured. Third, the total rise and decline are added, signs disregarded, and the sum divided by the number of years covered by the cycle. For example: the income paid out from agriculture was converted into percentages of the average volume, $6,368 million, during the swing from 1922 through 1933. In percentages of this average the standing at the first trough, in 1922, was 99.7; at the peak, in 1929, 115.4; at the succeeding trough, in 1933, 57.8. The total rise was 15.7; total decline, 57.6; rise and decline together, 73.3. Since this cycle covered 11 years, the average annual rise and decline amounted to 6.7. A similar computation was made for every cycle observed in the series, whether it was long or short. For the shorter oscillations, whenever a series contained more than one cycle, the averages obtained for each cycle were again averaged, yielding the figures appearing in Part B of Table 2.

As between income paid out and income produced, both measured in current dollars, the cyclical variability of the latter is greater. In terms of the rise and decline per year, this is true of every industrial branch, both for the long swing and the several shorter oscillations observed during the period under analysis. Net business savings and losses, as measured in our estimates, are obviously highly sensitive to changes in business conditions, and their inclusion in income produced renders the cyclical changes in it larger than in income paid out. Even were an adjustment made for changes due to returns from sale of assets, changes in the value of inventories, or the inflexibility of depreciation charges, income produced would quite probably still show a greater cyclical variability than income paid out.[4]

When we consider both the long swing and the short cycles in the income totals in current prices, the most marked cyclical fluctuations appear to characterize the four basic commodity-producing branches — mining, contract construction, manufacturing and agriculture. Of these four mining shows the largest cyclical rise and decline per year, agriculture the smallest. In the other five industries the evidence in the long swing and in the short cycles is contradictory. If we judge by the cyclical rise

[4] In the comparison between income produced and paid out attention should be given to the approximate character of the estimates of withdrawals by entrepreneurs. Three branches—agriculture, construction and trade—in which withdrawals by individual entrepreneurs and net profits made by them are not adequately covered by the available data, are subject to especial scrutiny. For agriculture, entrepreneurial withdrawals were estimated as compensation for the labor of farm operators and their families at the rate of payment to hired farm labor, raised 20 per cent to cover the estimated difference in consumption levels between independent farm operators and hired farm workers. For construction and trade, withdrawals by entrepreneurs were largely estimated on the basis of payments to employees; net profits by entrepreneurs were estimated on the basis of corporate profits. Hence, the differences between income paid out and produced in these three industrial branches may largely depend upon the correctness of the assumptions underlying the estimates.

In the other six branches the share of individual entrepreneurs is either relatively slight or nil. The estimates of income produced and paid out were based on independent data for labor incomes, property incomes, and net business losses and savings, the last mentioned as shown by corporate accounts.

and decline in the long swing the cyclical variability is smallest in other transportation and steam railroads; largest in electric light and power and gas. But neither electric light and power and gas nor communication shows any short cycles. Perhaps in these two industries the appreciable rise and decline during the long swing is due in large part to the presence of a marked upward trend, which is absent from both steam railroads and other transportation. Thus, on the whole, electric light and power and gas and communication may be considered relatively immune to cyclical disturbances, while transportation and trade appear to occupy middle ground between the former and the highly variable commodity-producing industries.

TABLE 2

CYCLICAL RISE AND DECLINE[1] IN INCOME PAID OUT AND PRODUCED, THE LATTER ADJUSTED AND UNADJUSTED FOR PRICE CHANGES, BASIC INDUSTRIAL BRANCHES, 1919-1934

A. The Long Swing

INDUSTRIAL BRANCH	INCOME PAID OUT		INCOME PRODUCED		PHYSICAL VOLUME (*income produced adjusted for changes in price of product*)		INCOME PRODUCED ADJUSTED FOR CHANGES IN PURCHASING POWER	
	Date of trough, peak, trough	Cyclical rise and decline per year[1]	Date of trough, peak, trough	Cyclical rise and decline per year[1]	Date of trough, peak, trough	Cyclical rise and decline per year[1]	Date of trough, peak, trough	Cyclical rise and decline per year[1]
Agriculture	1922-29-33	6.7	1922-25-32	11.8	1921-31-34	3.1	1921-25-32	9.2
Mining	1922-23-33	12.2	1921-26-32	15.3	1921-29-32	8.9	1921-26-32	14.2
Electric Light and Power and Gas	1919-30-34	9.5	1919-30-34	10.9	1921-29-32	8.4	1919-31-34	9.5
Manufacturing	1921-29-33	9.4	1921-29-32	15.0	1921-29-32	10.2	1921-29-32	14.4
Contract Construction	1921-28-33	13.6	1921-28-33	14.9	1920-28-33	13.4	1921-28-32	15.0
Steam Railroads	1922-27-33	6.6	1921-26-32	7.8	1921-26-32	7.7	1921-29-32	6.9
Other Transportation	1922-29-33	4.5	1922-29-33	5.5	no data		1921-29-33	3.5
Communication	1919-30-33	7.9	1919-29-33	9.4	no data		1919-29-33	7.3
Trade	1921-29-33	6.6	1921-29-32	9.5	no data		1921-29-32	8.5
Street Railways	1921-23-33	5.2	1921-23-33	6.0	1921-23-33	4.5	1919-23-33	5.1
Telephones	1919-30-33	7.6	1919-29-33	9.4	1919-29-33	6.5	1919-31-33	7.5

B. The Shorter Cycles

INDUSTRIAL BRANCH	INCOME PAID OUT			INCOME PRODUCED			PHYSICAL VOLUME (*income produced adjusted for changes in price of product*)			INCOME PRODUCED ADJUSTED FOR CHANGES IN PURCHASING POWER		
	No. of cycles	Date of successive troughs and peaks[2]	Average cyclical rise and decline per year[1]	No. of cycles	Date of successive troughs and peaks[2]	Average cyclical rise and decline per year[1]	No. of cycles	Date of successive troughs and peaks[2]	Average cyclical rise and decline per year[1]	No. of cycles	Date of successive troughs and peaks[2]	Average cyclical rise and decline per year[1]
Agriculture	3	1919-*20*-2-6-8-*9*-33	11.8	2	1922-*5*-7-*8*-32	12.7	4	1919-*20*-1-*6*-7-*8*-30-*1*-4	4.7	2	1921-*5*-6-*8*-32	9.8
Mining	4	1919-*20*-2-*3*-5-6-8-*9*-33	19.1	4	1919-*20*-1-*3*-4-*6*-8-*9*-32	30.1	3	1919-*20*-1-*3*-4-*9*-32	12.5	4	1919-*20*-1-*3*-4-*6*-8-*9*-32	25.4
Electric Light and Power and Gas		none			none		1	1919-*20*-1	6.8		none	
Manufacturing	3	1919-*20*-1-*3*-4-*9*-33	15.7	4	1919-*20*-1-*3*-4-*6*-7-*9*-32	19.8	3	1919-*20*-1-*3*-4-*9*-32	12.9	3	1921-*3*-4-*6*-7-*9*-32	15.9
Contract Construction	3	1919-*20*-1-*6*-7-*8*-33	19.1	3	1919-*20*-1-*6*-7-*8*-33	20.3		none		3	1919-*20*-1-*6*-7-*8*-32	15.6
Steam Railroads	4	1919-*20*-2-*3*-4-7-8-*9*-33	10.1	4	1919-*20*-1-*3*-4-*6*-7-*9*-32	12.2	4	1919-*20*-1-*3*-4-*6*-8-*9*-32	11.9	4	1919-*20*-1-*3*-4-*6*-7-*9*-32	8.0
Other Transportation	4	1919-*20*-2-*4*-5-6-7-*9*-33	6.3	4	1919-*20*-2-*4*-5-6-7-*9*-33	7.8		no data		3	1919-*20*-1-*4*-7-*9*-33	6.1
Communication		none			none			no data			none	
Trade	3	1919-*20*-1-6-7-*9*-33	8.9	3	1921-*3*-4-*6*-7-*9*-32	10.0		no data		3	1921-*3*-4-*6*-7-*9*-32	9.0
Street Railways	3	1919-*20*-1-*3*-8-*9*-33	7.6	1	1919-*20*-1	10.2	3	1919-*20*-1-*3*-5-*6*-33	4.5		none	
Telephones		none			none			none			none	

[1] Measured in percentages of the average value for the cycle.

[2] Date of peak in italics.

Adjustment for changes in the price of the product does not alter greatly the relative standing of the branches in respect of their cyclical variability. Mining, manufacturing, and for the major swing, construction, are still the branches characterized by the greatest cyclical variability; electric light and power and gas, telephones, and perhaps street railways are the branches most immune to cyclical disturbances during the period under analysis. However, the adjustment tends to reduce the cyclical variation of the income totals. In terms of physical volume agriculture is subject to but slight cyclical variability. In contract construction the variation of the income total during the major swing is affected little; the minor oscillations, however, disappear completely when adjustment is made for changes in the price of the product. On the whole, the four branches that showed the most conspicuous cyclical changes in the dollar income totals are those whose cyclical variability is most reduced when the income is expressed in terms of physical volume. On the contrary, in the other five branches, especially steam railroads, adjustment for price changes reduces cyclical variability but slightly.

The differences just noted in the effect of the specific adjustment for price changes upon the cyclical variability of the income totals in the several branches reflect mainly the greater variability in price of products of agriculture, mining, manufacturing, and in part construction, as compared with the relative rigidity in prices of public utility services. This difference in price behavior is not reflected in the uniform adjustment of the dollar income totals for changes in purchasing power of the products. This adjustment reduces the cyclical variability of the income totals (except for the long swing in contract construction) but not to the same extent as does the adjustment for price changes of the products; it also affects little the relative standing of the branches in the cyclical variability of their income totals.

Movement over the period

The sixteen years covered by the income estimates in this *Bulletin* were, as is any segment of historical reality, subject to peculiarities that make them unique. Consequently, the measurement of changes within this period does not yield results necessarily valid beyond it. The differences observed in the cyclical variability of the income totals among the several industrial branches or among the various types of income total, may or may not be found in another period although other evidence of the varying susceptibility to cyclical disturbances of prices and output in the different industrial branches tends to substantiate them. This qualification applies still more strongly to any results of an analysis of changes over the period as a whole. Nevertheless, we have attempted to measure these changes in the belief that it would be helpful in revealing a type of movement not shown by the measures of cyclical change given above, would provide a characteristic of the period as a whole that may be useful in economic analysis of the recent past and of the present; and, when combined with data for a longer period, may afford basis for a more rounded interpretation than is possible in this *Bulletin*. The period is too short and too greatly affected by cyclical and random disturbances to reveal clearly the secular movements, i.e., those movements whose direction and rate of change tend to persist over relatively long periods. Quite possibly the measures obtained are gauges of the movement during the very long downward swing of the price level that always seems to follow a major war and that appears to have begun in this country shortly after the World War; and this movement may change appreciably if the price level enters upon a prolonged rise. With this qualification, viz., that the longer time changes measured in the subsequent analysis are valid only for the specific period 1919-34, and should not be interpreted as valid beyond this period, we may proceed to observe what the analysis shows.

In view of the brevity of the period and the existence within it of a long cyclical swing, the change over the period as a whole must necessarily be measured along a straight line, a line that can show rise, decline or a horizontal level. The slope of this line was computed by the simple method of averaging the series for two segments in the total period 1919-34, dividing the difference between the two averages by the number of years in the interval from the mid-point of the first segment to the mid-point of the second segment, and thus obtaining the average change per year. But this method was applied in a variety of ways. First, the change per year was computed from the average for the first eight years to the average for the second eight years. Then, in order to test for the effect on the slope of the cyclical and random characteristics of the extreme years, a similar computation was undertaken for the middle fourteen years of the period (omitting 1919 and 1934), for the middle twelve years (omitting 1919, 1920, 1933 and 1934), and for the middle ten years (omitting 1919, 1920, 1921, 1932, 1933 and 1934). Finally, the average change per year was computed from the average for the period of rise to the average for the period of decline in the long swing (Table 3). The measures are deficient as gauges of the rate of long-time change, but all show quite uniformly the differences among

TABLE 3

CHANGE OVER THE PERIOD IN INCOME PAID OUT AND PRODUCED, THE LATTER ADJUSTED AND UNADJUSTED FOR PRICE CHANGES, NINE BASIC INDUSTRIES, 1919-1934

(all measures in percentages of the average value of each series for 1919-1934)

CHANGE PER YEAR FROM:	AGRICULTURE	MINING	ELECTRIC LIGHT AND POWER AND GAS	MANUFACTURING	CONTRACT CONSTRUCTION	STEAM RAILROADS	OTHER TRANSPORTATION	COMMUNICATION	TRADE	STREET RAILWAYS	TELEPHONES
INCOME PAID OUT											
1919-26 to 1927-34	—3.4	—4.5	+ 7.7	—1.1	—1.9	—2.6	—2.4	+4.3	—0.4	—3.2	+4.8
1920-26 to 1927-33	—3.1	—5.1	+ 8.6	—0.8	—2.0	—2.5	—2.4	+4.7	—0.1	—3.5	+5.2
1921-26 to 1927-32	—1.6	—4.3	+ 9.6	+0.5	—1.0	—1.5	—1.5	+5.5	+0.8	—3.3	+5.9
1922-26 to 1927-31	—0.7	—3.8	+10.6	+1.6	+0.1	—0.5	—0.8	+6.3	+1.6	—3.1	+6.5
Period of rise to period of decline in long swing	—4.9	—3.0	+ 5.8	—3.0	—4.8	—3.0	—3.5	+3.3	—1.6	—2.7	+4.0
INCOME PRODUCED											
1919-26 to 1927-34	—5.2	—5.8	+ 7.3	—2.6	—2.6	—3.0	—3.1	+3.7	—2.2	—4.2	+4.3
1920-26 to 1927-33	—4.5	—6.6	+ 8.2	—2.5	—2.7	—3.0	—3.2	+4.2	—1.8	—4.6	+4.8
1921-26 to 1927-32	—3.4	—5.3	+ 9.4	—1.4	—1.6	—2.2	—2.3	+5.2	—1.3	—4.5	+5.8
1922-26 to 1927-31	—2.4	—5.3	+10.8	—0.7	—0.6	—1.3	—1.6	+6.4	—1.0	—4.3	+6.9
Period of rise to period of decline in long swing	—2.7	—4.2	+ 4.3	—5.1	—5.8	—1.7	—4.8	+2.9	—3.9	—3.8	+3.7
PHYSICAL VOLUME											
1919-26 to 1927-34	+0.9	+1.1	+ 5.8	+0.7	—1.6	—2.2	no data	no data	no data	—2.8	+3.8
1920-26 to 1927-33	+1.1	+1.2	+ 6.3	+0.9	—1.3	—2.1	"	"	"	—2.9	+4.1
1921-26 to 1927-32	+1.3	+1.8	+ 7.1	+1.6	—0.8	—1.4	"	"	"	—2.6	+4.7
1922-26 to 1927-31	+1.2	+2.4	+ 8.0	+2.3	+0.6	—0.8	"	"	"	—2.4	+5.4
Period of rise to period of decline in long swing	+0.2	—0.3	+ 5.7	—0.7	—3.5	—0.9	"	"	"	—2.0	+3.2
INCOME PRODUCED ADJUSTED FOR CHANGES IN PURCHASING POWER											
1919-26 to 1927-34	—4.0	—4.6	+ 8.6	—1.3	—1.6	—1.7	—1.6	+5.2	—0.8	—2.8	+5.8
1920-26 to 1927-33	—3.2	—5.3	+ 9.8	—1.2	—1.6	—1.6	—1.7	+5.7	—0.5	—3.1	+6.4
1921-26 to 1927-32	—2.7	—4.6	+10.6	—0.7	—1.0	—1.3	—1.4	+6.3	—0.5	—3.5	+6.9
1922-26 to 1927-31	—1.9	—4.8	+11.3	—0.3	—0.1	—0.8	—1.0	+6.9	—0.5	—3.8	+7.4
Period of rise to period of decline in long swing	—1.7	—3.6	+ 6.1	—4.0	—3.1	—3.1	—2.6	+5.0	—2.5	—1.5	+4.3

the various types of income total or among the several industrial branches.[5]

Almost uniformly, the rate of change over the period in income produced is lower than in income paid out, both measured in current dollars. However, for electric light and power and gas and communication this disparity is smaller than for the other industries; and in these two branches the rate of change in income produced is higher than in income paid out for the ten years 1922-31.

The same two branches are the only ones for which both income paid out and produced in current dollars rose consistently over the period. In manufacturing and trade income paid out rose when from the period two years are omitted at each end; the same is true of contract construction for 1922-31. But income produced in these three industries, and both income paid out and produced in all the other industries (agriculture, mining, steam railroads and other transportation) declined consistently over the period as a whole. The most appreciable rates of decline in both income paid out and produced were in mining and agriculture.

The specific adjustment for price changes of the product had a marked effect on the change over the period in the totals of income produced, but the effect differs significantly among the various industrial branches. In those industries in which the dollar income totals declined over the period the adjustment served to raise materially the rate of change per year, and in some industries to convert a decline into a rise. This effect was most marked in agriculture, mining and manufacturing, primarily branches in which prices, quite sensitive to business conditions and to fluctuations in supply, have declined substantially over the period. But even in the transportation branches, in which prices are relatively rigid, prices apparently declined over the period as a whole; as a result the totals adjusted for price changes declined less than the unadjusted.

As contrasted with the industries whose unadjusted income totals declined, in the two industries with a rising movement, electric light and power and gas, and telephones, adjustment for price changes lowered the rate of change per year. The inference is that either the prices of these products have on the whole risen over the period, or that, with prices per unit of product of constant quality

[5] In addition to the measures in Table 3, the average change per year was computed for each series between each following pair of segments: 1923-26 and 1927-30; 1919-25 and 1928-34; 1919-24 and 1929-34; 1919-23 and 1930-34. The conclusions yielded by these additional measures were the same as those stated in the text on the basis of the measures presented in Table 3.

unchanged or declining, the shift in the demand for these products was towards the higher price groups. Since in at least one branch, electric light and power and gas, there are definite indications of a downward trend over the period in prices of the product to ultimate consumers, the second inference appears more valid.

The movement over the period in income produced, adjusted for changes in the prices of the products, is significantly different from that in the totals in current dollars. In terms of current dollars, mining, street railways and agriculture had the most conspicuous downward movement, followed at some distance by steam railroads. Electric light and power and gas and telephones were marked by a rising movement; manufacturing, contract construction and trade occupied middle ground. In terms of physical volume of production, street railways, steam railroads and contract construction still declined; electric light and power and gas and telephones still showed the highest rates of rise; agriculture, mining and manufacturing rose.

Adjustment for changes in purchasing power affected but little the differences in movement of the income totals among the several industrial branches. It increased the rate of change in all industries, including those whose unadjusted dollar totals rose. But of the industries whose dollar income totals declined, only in steam railroads did it cause a greater rise in the rate of change over the period than was effected by the adjustment for price changes of the product. Hence, the following inference may be tentatively suggested, subject to the qualifications that attach to our measures: that in the other industries whose dollar income totals declined, especially agriculture, mining and manufacturing, the decline in the prices of the products was more appreciable than in the prices of consumable goods, and hence the terms of exchange for the income recipients of these industries were becoming more unfavorable. On the contrary, income recipients in electric light and power and manufactured gas, telephones, and perhaps, although not certainly, steam railroad transportation, appear to have benefited from the long-time movement in terms of exchange, that is, the prices for their services rose more or declined less than the prices of consumable goods.

CHANGES IN THE RELATIVE SHARES OF VARIOUS TYPES OF PAYMENT

Changes in the relative shares of various types of payment indicate shifts in the compensation of various groups. Wages are received by manual workers and constitute the preponderant part of their total income. Wage recipients form a fairly distinct group, with a rather low per capita income. Of the total accumulated productive capital of the country they command little beyond the part represented by their capacity to render services. Changes in the share of wages are thus changes in the relative magnitude of compensation of a distinct group; and in view of the stability of the entire wage-earning population sizable shifts in the relative share of wages over periods as short as two or three years signify, even without additional data, corresponding relative changes in the per capita income of individuals belonging to the wage-earning group. Similarly, salaries constitute the bulk of compensation of another group of employees, with an average income somewhat higher than that of wage earners. Hence changes in the relative weight of total salary payments indicate shifts in the total compensation of that group, and to some extent in the relative per capita compensation of the total salaried population. Dividends and interest disbursements are received largely by those whose average income is high; and a change in the proportion of income going out as dividends and interest is, with certain qualifying conditions, an index of the change in the share of the income received by the high income groups in the total income-receiving population.

The relative weights of the various income shares may be studied in percentages of either income produced or paid out. But from the comments above full significance obviously attaches only to percentages of income paid out. Income produced includes net business savings or losses, which can hardly be classified as a current income share of any individual member of the various groups. Incurrence of a business loss or the retention of a business saving by an enterprise may affect the fortunes of security holders, who derive property incomes such as dividends or interest, but if changes in the value of holdings of individuals be considered, the net saving or loss of the business establishment is hardly a measure of them. Moreover, saving or loss in an industry is as important to the employees as to the owners, and has as much effect on their economic welfare. Upon this assumption, the percentage allocation of income produced among the various types of payment would be identical with that of income paid out. For these reasons it appears best to confine the study of types of payment to income paid out, although we fully recognize that it is not the only measure of economic welfare of individuals.

This decision not to treat net business savings or losses as an income share, comparable in nature to such actual disbursements as wages, salaries or cash dividends, may be objected to particularly in the case of individual entrepreneurs, for the separation between the sphere of the business economy and the area in which these entrepreneurs act as ultimate consumers is not so clear as that between the corporation and the individuals who receive income from it. But an estimate of national income requires the utmost possible uniformity of treatment and definition. It attempts to measure what, on the basis of clear-cut and invariable criteria, should be counted as income, rather

than to gauge what may be conceived by various individuals to be their income. In such an estimate the same distinction is to be made between withdrawals by entrepreneurs and their net business savings and losses as between the payment of income shares by corporations and their net business savings or losses. The statistical difficulties of the distinction between withdrawals by entrepreneurs and their net business savings and losses, although they affect the reliability of the resulting estimates, are, of course, irrelevant to the argument.

TABLE 4

CHANGE IN PERCENTAGE SHARES OF THE MAJOR TYPES OF PAYMENT DURING CYCLES IN INCOME PAID OUT

A. The Long Swing

	AGRICULTURE	MINING	ELECTRIC LIGHT AND POWER AND GAS	MANUFACTURING	CONTRACT CONSTRUCTION	STEAM RAILROADS	OTHER TRANSPORTATION	COMMUNICATION	TRADE	TOTAL[1]
Compensation of employees										
Change per year during cyclical rise	+0.2	—0.2	—1.4	—0.2	+0.6	—0.7	+0.1	—0.2	+0.4	+0.2
Change per year during cyclical decline	—1.2	—0.4	—0.6	+0.3	—3.1	—0.5	—0.4	—3.9	—0.8	—0.9
Change from period of rise to period of decline	—1.4	—0.2	+0.8	+0.5	—3.7	+0.2	—0.5	—3.7	—1.2	—1.1
Withdrawals by entrepreneurs										
Change per year during cyclical rise	0.0	—0.4	—0.1	—0.2	—0.6	None	0.0	None	—0.6	—0.5
Change per year during cyclical decline	+0.3	0.0	0.0	+0.1	+2.8	None	—0.1	None	+1.4	+0.5
Change from period of rise to period of decline	+0.3	+0.4	+0.1	+0.3	+3.4	None	—0.1	None	+2.0	+1.0
Dividend and interest payments										
Change per year during cyclical rise	—0.1	+0.6	+1.5	+0.4	0.0	+0.7	—0.1	+0.1	+0.2	+0.4
Change per year during cyclical decline	+0.9	+0.4	+0.6	—0.4	+0.3	+0.5	+0.4	+3.9	—0.5	+0.4
Change from period of rise to period of decline	+1.0	—0.2	—0.9	—0.8	+0.3	—0.2	+0.5	+3.8	—0.7	0.0

B. The Shorter Cycles

Number of cycles or phases	3	4	No short cycles	3	3	4	4	No short cycles	3	4
Compensation of employees										
Average change per year during cyclical rises	+0.1	—0.3		+0.1	+1.5	+0.7	+2.1		—0.1	+0.7
Average change per year during cyclical declines	—0.5	—0.4		—1.1	—3.1	—1.0	—1.5		—0.3	—1.0
Average change from periods of rise to periods of decline	—0.6	—0.1		—1.2	—4.7	—1.8	—3.6		—0.1	—1.7
Withdrawals by entrepreneurs										
Average change per year during cyclical rises	+ 0.1	—0.2		—0.3	—1.5	None	—0.1		+0.2	—0.8
Average change per year during cyclical declines	—0.2	+0.1		+0.2	+2.6	None	—0.1		+0.3	+0.1
Average change from periods of rise to periods of decline	—0.4	+0.3		+0.5	+4.1	None	0.0		+0.1	+0.9
Dividend and interest payments										
Average change per year during cyclical rises	—0.2	+0.6		+0.2	0.0	—0.7	—2.0		—0.1	+0.1
Average change per year during cyclical declines	+0.7	+0.3		+0.9	+0.6	+1.0	+1.4		0.0	+0.9
Average change from periods of rise to periods of decline	+0.9	—0.3		+0.7	+0.6	+1.8	+3.4		0.0	+0.8

[1] The dates of trough, peak and trough for the long swing in total income paid out are 1921-29-33. For the shorter cycles the successive dates are 1919-*20*-21-*23*-24-*26*-27-*29*-33. The dates of peaks are in italics.

Changes during cycles in income paid out

In analyzing the movements in the percentage allocation of income paid out by types of payment the first question of interest is what happens to the relative shares as income paid out undergoes the cyclical changes observed in Chart 1 and measured in Table 2. Does the compensation of employees rise more than do the other income shares during periods of cyclical rise in total income paid out, and consequently, does the percentage share of this type of payment rise during these periods? Or do the other types of payment participate more heavily in the cyclical expansion of total income paid out, and hence do their percentage shares increase during these periods? Similar questions arise concerning the behavior of the percentage shares of the various types of payment during periods of cyclical contraction in total income.

Table 4 is designed to provide answers to these questions. The procedures used differ from those in Table 2 in three important respects. First, the changes in the percentage shares accounted for by the various types of payment, are studied not for the cycles observed in them, but for the cycles in income paid out in each industrial branch. Second, the rise and decline are measured in the original units of the series, i.e., in percentages of income paid out. The series were not converted to relatives of the average value of each cycle. Third, instead of measuring the combined cyclical rise and decline per year for each cycle, we measure in Table 4 the change from the annual rate of movement in the period of cyclical expansion to that in the succeeding period of cyclical contraction.

The evidence of Table 4 does not yield definitive conclusions directly, but a careful scrutiny reveals some general results. During the cyclical expansion in the long swing from 1921-22 to 1933 the percentage share of compensation of employees increased in four of the nine industrial branches, as well as in the total for the nine industries combined; for the shorter cycle averages it increases in five of the seven industrial branches whose net income shows these shorter cycles, and again in the total of the nine industries combined.

The tendency of the percentage share of compensation of employees to decline during periods of cyclical decline in total income paid out is more uniform. In the contraction phase of the long swing this decline appears in eight of the nine industrial branches; and for the shorter cycle averages, in the seven industries showing short cycles. There is also considerable uniformity in the way the rate of annual change in the percentage share of payments to employees declines from the period of cyclical rise in income paid out to the succeeding period of cyclical decline: for the long swing in six of the nine industrial branches, and for the shorter cycle averages in all seven industrial branches analyzed.

Thus the relative share of the compensation of employees rises during cyclical rises in total income paid out and declines during cyclical declines in it, particularly during the short cycles. Consequently, payments to employees must rise and decline more than total income payments during cyclical expansions and contractions in the latter.

The evidence of the measures for the percentage share of the combined dividend and interest payments complements clearly the observations just made concerning the share of payments to employees. During periods of cyclical rise in income paid out the percentage share of dividend and interest payments rises in some industrial branches and declines in others. During the period of expansion in the long swing a decline is shown in two of the nine industrial branches; in one no change is apparent. For the shorter cycle averages the evidence of a decline in the relative share of dividend and interest payments during periods of cyclical rise in income paid out is more impressive; it occurs in four of the seven industries; one of the remaining three shows no change. On the other hand, during periods of cyclical decline in income paid out there is a pronounced tendency in the percentage share of dividend and interest payments to rise, for the long swing in seven of the nine industrial branches, and for the shorter cycle averages in six of the seven industries; the other shows no change. Nevertheless, there still remain some exceptions in the tendency of the rate of annual change in the percentage share of dividend and interest payments to rise from a period of cyclical expansion in income paid out to the succeeding period of contraction. For the long swing this tendency is evident in only four of the nine branches, and for the shorter cycle averages, in five of the seven.

Thus, at least for the shorter cycles in income paid out, the percentage share of combined dividend and interest payments tends to decline during periods of cyclical rise, and to rise during periods of cyclical decline. This indicates that in these shorter cycles in income paid out, dividend and interest payments tend to rise less than do all payments during periods of cyclical expansion in the latter and to decline less during periods of cyclical contraction. In the longer swing in income paid out, the share of dividend and interest payments tends to rise during the phases of both cyclical expansion and contraction, suggesting the conclusion that over the period as a whole this percentage share of dividend and interest payments has risen.

The conclusions with respect to the movement of the percentage shares of withdrawals by entrepreneurs are of less interest, both because of the approximate character of the underlying estimates and because this type of payment is of importance in only three of the nine industrial branches. The general impression is that it moves in a direction opposite to that of cyclical changes in income paid out. This is almost uniformly true of the long swing in income paid out, even though there are some exceptions when the shorter cycle averages are studied. Thus, when income paid out experiences a cyclical rise, withdrawals by entrepreneurs rise less than do the other types of payment; they also decline less when income paid out experiences a cyclical decline.*

Movement over the period

The discussion in the preceding section has already suggested that over the period as a whole significant movements occurred in the relative shares of the various types of payment. Study of the changes in the percentage shares of payments to employees, withdrawals by entrepreneurs and dividend and interest payments for the successive short cycles in total income paid out corroborates this suggestion (Table 5).

The rise in the share of compensation of employees during periods of cyclical rise in income paid out tended, on the whole, to diminish during the successive cyclical expansions; during the latest cyclical expansion, 1927-29, this rise turned into a decline. Correspondingly, the changes during the same cyclical phase in the relative share of dividend and interest payments, which were negative in the first cyclical expansion, 1919-20, have become positive in the latest two periods of cyclical expansion in income paid out. During periods of cyclical contraction in the latter, the decline per year in the share of compensation of employees manifests no definite tendency to become larger, and the similar measure for the share of dividend and interest payments shows no tendency towards a rise. But when the total movement during the successive cyclical contractions is considered, the longer duration of the latest contraction suggests a decline in the relative share of payments to employees and a rise in the relative share of dividend and interest payments. When the total net change in these shares is computed for each of the four short cycles in income paid out, two tendencies indicate clearly the difference in their movement over the period as a whole. The latest two of these four cycles show (a) a net decline in the share of payments to employees; (b) a greater net rise than in the first two cycles in the share of dividend and interest payments.

Thus, judging by the evidence of Table 5, the movement of the percentage shares over the period was distinctly downward for compensation of employees; distinctly upward in the percentage share of dividend and interest payments; and, on the whole, indeterminate for withdrawals by entrepreneurs. But this result for the total of the nine industries combined does not necessarily mean that a similar movement characterizes the relative shares of the major types of payment within each industrial branch. The share of payments to employees for the combined industries may have declined because of the increase in the relative weight of those industries which are characterized by a relatively low average percentage that salaries and wages constitute of income paid out. Thus the electric light and power and manufactured gas industry, whose total net income increased over the period more rapidly than did the income total for the other eight branches, is also the one in which the percentage share of salaries and wages is relatively small. It is therefore important to analyze over the period as a whole these movements in the percentage allocation of income paid out within each industry (Table 6).

*In these conclusions on the differing variability of the relative shares of various types of payment during cycles in income paid out, no mention was made of the possibility of a lead or lag of the cyclical changes in the percentage shares as compared with cycles in income paid out. The consideration of this possibility, of importance only for the long swing, indicates that it affects but little the conclusions derived from Table 4. The interpretation of these conclusions, which suggests that during the cyclical rises and declines in income paid out, particularly the short ones, wages and salaries rise and decline more appreciably than do withdrawals by entrepreneurs or the combined item of dividends and interest payments, still holds.

TABLE 5

MOVEMENT OF THE PERCENTAGE SHARES OF MAJOR TYPES OF PAYMENT FOR THE TOTAL OF NINE INDUSTRIAL BRANCHES, IN THE SUCCESSIVE SHORT CYCLES IN INCOME PAID OUT

CHANGE IN PERCENTAGE SHARE	SUCCESSIVE PERIODS OF CYCLICAL RISE IN INCOME PAID OUT				SUCCESSIVE PERIODS OF CYCLICAL DECLINE IN INCOME PAID OUT				SUCCESSIVE CYCLES IN INCOME PAID OUT			
	1919-20	*1921-23*	*1924-26*	*1927-29*	*1920-21*	*1923-24*	*1926-27*	*1929-33*	*1919-21*	*1921-24*	*1924-27*	*1927-33*
Compensation of employees												
Total	+1.4	+2.9	+0.3	—0.2	—1.2	—1.1	—0.7	—3.7	+0.2	+1.8	—0.4	—3.9
Per year	+1.4	+1.4	+0.2	—0.1	—1.2	—1.1	—0.7	—0.9				
Withdrawals by entrepreneurs												
Total	—0.7	—2.9	—1.3	—0.8	—1.0	+0.7	+0.1	+2.2	—1.7	—2.2	—1.2	+1.4
Per year	—0.7	—1.4	—0.6	—0.4	—1.0	+0.7	+0.1	+0.6				
Dividend and interest payments												
Total	—0.7	0.0	+1.0	+1.0	+2.2	+0.3	+0.7	+1.6	+1.5	+0.3	+1.7	+2.6
Per year	—0.7	0.0	+0.5	+0.5	+2.2	+0.3	+0.7	+0.4				

TABLE 6

MAJOR TYPES OF PAYMENT, CHANGES OVER THE PERIOD IN PERCENTAGE SHARE, BASIC INDUSTRIAL BRANCHES, 1919-1934

INDUSTRIAL BRANCH AND TYPE OF PAYMENT	AVERAGE FOR *1919-34*	TOTAL CHANGE IN AVERAGE FROM: *1919-26* TO *1927-34*	*1920-26* TO *1927-33*	*1921-26* TO *1927-32*	*1922-26* TO *1927-31*	CHANGE PER YEAR IN AVERAGE FROM: *1919-26* TO *1927-34*	*1920-26* TO *1927-33*	*1921-26* TO *1927-32*	*1922-26* TO *1927-31*
Agriculture									
Compensation of employees	16.4	— 1.6	— 1.1	— 0.5	0.0	—0.2	—0.2	—0.1	0.0
Withdrawals of entrepreneurs	77.6	+ 0.1	0.0	0.0	—0.1	0.0	0.0	0.0	0.0
Dividends and interest payments	6.0	+ 1.4	+ 1.1	+ 0.6	+0.1	+0.2	+0.2	+0.1	0.0
Mining									
Compensation of employees	84.1	— 4.0	— 3.6	— 3.4	—3.4	—0.5	—0.5	—0.6	—0.7
Withdrawals of entrepreneurs	1.4	— 0.1	— 0.1	— 0.1	—0.2	0.0	0.0	0.0	0.0
Dividends and interest payments	14.5	+ 4.2	+ 3.7	+ 3.5	+3.6	+0.5	+0.5	+0.6	+0.7
Electric Light and Power and Gas									
Compensation of employees	42.5	—14.1	—13.5	—11.5	—9.0	—1.8	—1.9	—1.9	—1.8
Withdrawals of entrepreneurs	0.3	— 0.4	— 0.4	— 0.3	—0.2	—0.1	—0.1	0.0	0.0
Dividends and interest payments	57.2	+14.6	+13.9	+11.8	+9.2	+1.8	+2.0	+2.0	+1.8
Manufacturing									
Compensation of employees	83.9	— 2.9	— 2.9	— 2.8	—3.0	—0.4	—0.4	—0.5	—0.6
Withdrawals of entrepreneurs	2.3	— 0.7	— 0.6	— 0.6	—0.5	—0.1	—0.1	—0.1	—0.1
Dividends and interest payments	13.7	+ 3.6	+ 3.7	+ 3.5	+3.6	+0.4	+0.5	+0.6	+0.7
Contract Construction									
Compensation of employees	80.6	— 2.0	— 0.6	+ 2.0	+2.9	—0.2	—0.1	+0.3	+0.6
Withdrawals of entrepreneurs	17.1	+ 0.8	— 0.6	— 3.0	—3.8	+0.1	—0.1	—0.5	—0.8
Dividends and interest payments	2.3	+ 1.2	+ 1.2	+ 1.0	+0.9	+0.2	+0.2	+0.2	+0.2
Steam Railroads									
Compensation of employees	78.6	— 5.6	— 5.4	— 4.4	—3.7	—0.7	—0.8	—0.7	—0.7
Withdrawals of entrepreneurs	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Dividends and interest payments	21.4	+ 5.6	+ 5.4	+ 4.4	+3.7	+0.7	+0.8	+0.7	+0.7
Other Transportation									
Compensation of employees	80.2	— 3.1	— 3.6	— 3.0	—1.4	—0.4	—0.5	—0.5	—0.3
Withdrawals of entrepreneurs	0.4	— 0.1	— 0.1	0.0	+0.1	0.0	0.0	0.0	0.0
Dividends and interest payments	19.4	+ 3.2	+ 3.7	+ 3.1	+1.3	+0.4	+0.5	+0.5	+0.3
Communication									
Compensation of employees	77.2	— 6.5	— 5.7	— 3.8	—2.2	—0.8	—0.8	—0.6	—0.4
Withdrawals of entrepreneurs	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Dividends and interest payments	22.8	+ 6.5	+ 5.7	+ 3.8	+2.2	+0.8	+0.8	+0.6	+0.4
Trade									
Compensation of employees	72.2	+ 0.1	0.0	— 0.1	—0.4	0.0	0.0	0.0	—0.1
Withdrawals of entrepreneurs	23.1	— 0.2	— 0.3	— 0.4	—0.5	0.0	0.0	—0.1	—0.1
Dividends and interest payments	4.7	+ 0.2	+ 0.4	+ 0.6	+0.8	0.0	+0.1	+0.1	+0.2
Total of 9 Industries									
Compensation of employees	68.2	— 1.8	— 2.0	— 1.7	—1.5	—0.2	—0.3	—0.3	—0.3
Withdrawals of entrepreneurs	19.7	— 2.1	— 1.7	— 1.5	—1.4	—0.3	—0.2	—0.2	—0.3
Dividends and interest payments	12.1	+ 3.9	+ 3.8	+ 3.3	+2.9	+0.5	+0.5	+0.6	+0.6

The percentages are grouped in Chart 3 so as to show together the measures for each type of payment in each industry. Chart 3 indicates clearly the existence in most industrial branches of a downward movement in the percentage share of payments to employees and of withdrawals by entrepreneurs, and of an upward movement in the share of dividend and interest payments.

The measures in Table 6 were computed by the method that was used for Table 3, except that here we show not only the change per year but also the total change that occurred for each series from the average for the first segment of the period to the average for the second segment.

The rate of change between the successive phases of the long swing was also computed, but since its evidence is quite similar to that of the other measures,[7] it was omitted from Table 6 and from the similarly constructed Tables 7 and 8.

For mining, manufacturing, other transportation, steam railroads, communication and electric light and power and gas the percentage share of the compensation of employees, as measured by the rate for each period, declined. The decline was most appreciable in the three industries last mentioned. In agriculture and trade the decline is shown for most periods but there is some doubt as to the significance of this movement, especially in trade. In contract construction no definite direction in the movement over the period is indicated. In the total for the nine industries the percentage share of compensation of employees declined for each period.

The relative share of withdrawals by individual entrepreneurs declined over the period in manufacturing, trade, electric light and power and gas, and mining; and the preponderance of evidence in contract construction is also towards a generally declining movement. In agriculture and other transportation the evidence is inconclusive. But in the weighted total for the nine industries the share of entrepreneurial withdrawals declined consistently and, on the whole, appreciably. This is due not only to the decline within the single industries, but also to the fact that the combined net income of the three branches in which this type of payment is important—agriculture, construction and trade—has been subject to a downward movement more marked than that in the combined income of the other six branches.

Since the relative shares of compensation of employees and of withdrawals by individual entrepreneurs decline, the percentage share of the combined dividend and interest payments must obviously rise over the period. And this indeed is true of each industrial branch. The most appreciable increases occurred in electric light and power and gas, communication, steam railroads and mining; the least significant in trade, agriculture and construction.

This conclusion is valid only for the specific period studied and whether it will continue depends upon its cause. It may be an expression of the general secular tendency observable in our economic system of replacing direct labor by such products of past labor as machinery and other capital equipment, with the result that the relative share of the compensation of direct labor would naturally be tending to shrink, while the percentage share of the investment in capital would tend to increase. Perhaps such a persistent secular tendency was especially accelerated during the post-War period when relatively high wage rates and a downward movement of prices stimulated rationalization and replacement of direct labor by machinery. It is very important to observe that the relative share of compensation of employees was especially high during the first half of the post-War period, as compared with the level not only during the War but also before 1914. Dr. King's estimates in his *National Income and Its Purchasing Power* (National Bureau of Economic Research, 1930) show that in mining, manufacturing, construction, steam railroads, other transportation and communication, the average percentage share of compensation of employees in income paid out was substantially higher for 1919-25 than for either 1914-18 or 1909-13.

The downward movement in the relative share of withdrawals by entrepreneurs may be an expression of the secular tendency observable in our economy towards a further extension of the corporate form of business organization.

Wages and salaries

The available data make possible a separate estimate of the shares of wages and of salaries for only three industrial branches — mining, manufacturing and steam railroads. There is little use in comparing changes in these shares over short periods, for only the well-known greater variability of wage payments would be revealed. Table 7 accordingly presents measures of change in wages and salaries as percentages of total net income paid out over the longer spans of time alone. The contrast in movement stands out clearly. In each of the three branches the percentage of income paid out accounted for by wages declined over the period, while the percentage share of salaries rose. Thus, for these three branches the downward movement in the percentage share of compensation of employees, shown in Table 6, is accounted for exclusively by the downward movement of the relative share of wages.

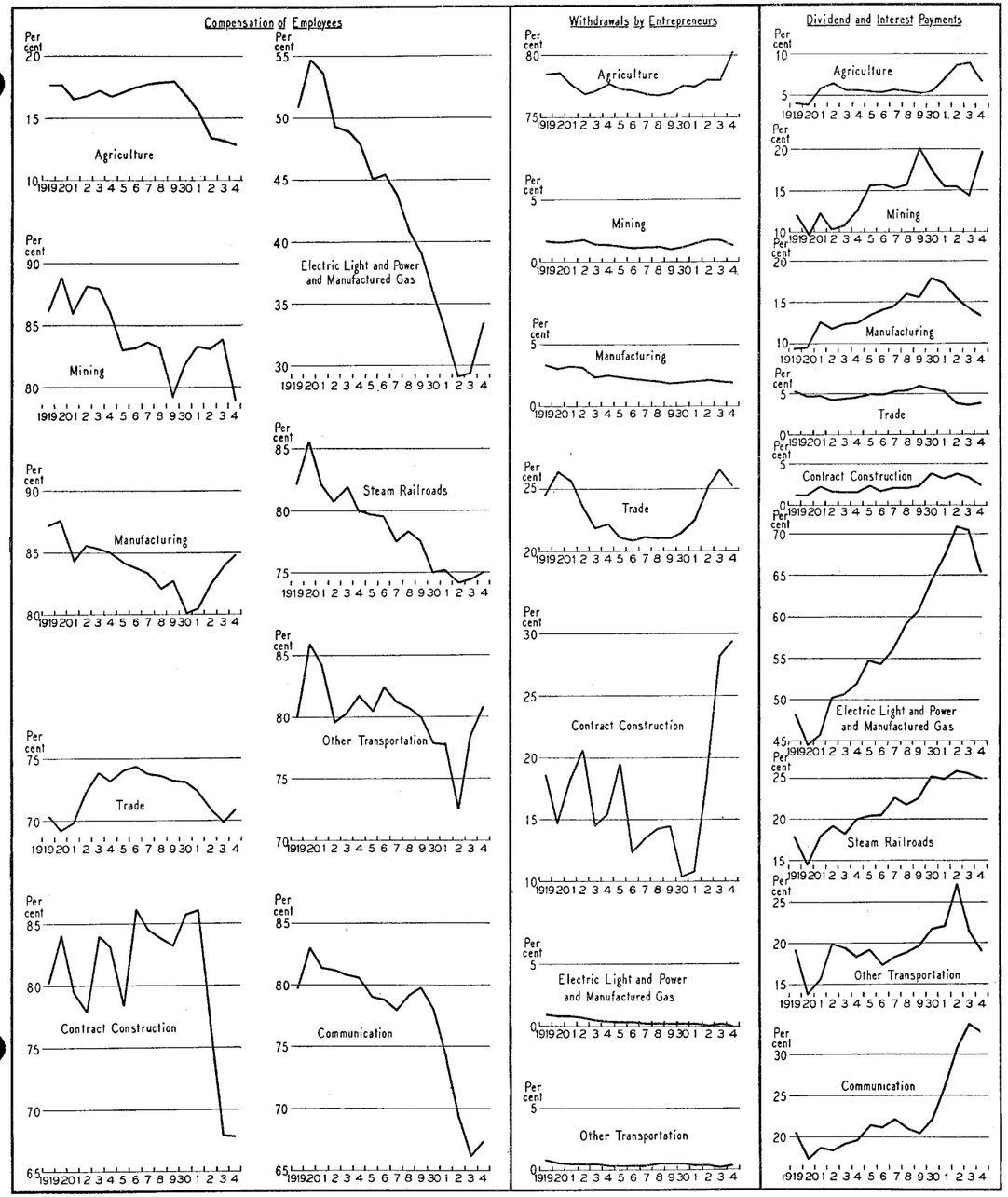
But perhaps the favorable showing in these three industries of total salaries as compared with total wages was

[7] For the percentages analyzed in Table 6 the average change per year was also computed for the following periods: from 1923-26 to 1927-30; 1919-25 to 1928-34; 1919-24 to 1929-34; 1919-23 to 1930-34. These additional measures fully corroborated the conclusions stated in the text on the basis of the evidence presented in Table 6.

CHART 3

MAJOR TYPES OF PAYMENT, PERCENTAGES OF INCOME PAID OUT

NINE BASIC INDUSTRIAL BRANCHES, 1919-1934



due to a greater growth in the number of salary recipients. And perhaps this greater growth in the number of salary recipients led to a diminishing disparity between average wage and average salary.

These questions are answered in Table 7. The change per year over the period in the number of salaried workers employed is indeed higher than in the number of wage earners employed, whether these measures be expressed in absolute units (as they are in Table 7) or in percentages of the average number in each of the two groups of employees. Nevertheless, the change per year in the average salary is higher than that in the average wage. Indeed, with respect to average compensation, the movement of wages is downward while that of salaries is upward.

This decline in the relative share of wages and increase in the relative share of salaries may be an expression of the same shift from direct labor to the use of capital equipment that was noted above. In the long run the improvement of industrial technique tends to increase not only the income share of capital, but also the need for skilled supervision and consequently, the share of salaries. A comparison with Dr. King's data for earlier years shows that in mining and steam railroads the share of salaries increased from 1909-13 to 1919-25 more than the share of wages, while in manufacturing the increase in the share of wages was slightly larger than in the share of salaries.

This differential movement during the post-War years, accompanied as it was in the three industries by an increasing disparity between the average wage and salary, suggests interesting changes in the distribution of earned income among all employees. Let us assume that the inequality in the income distribution within the salary-earning and within the wage-earning groups is constant or rising, and that the inequality in the income distribution

TABLE 7

CHANGES OVER THE PERIOD IN PERCENTAGE SHARE OF WAGES AND OF SALARIES, NUMBER OF WAGE EARNERS AND SALARIED WORKERS EMPLOYED, AND AVERAGE WAGE AND SALARY, MINING, MANUFACTURING, STEAM RAILROADS, 1919-1934

INDUSTRIAL BRANCH AND ITEM MEASURED	AVERAGE FOR 1919-34	TOTAL CHANGE IN AVERAGE FROM: 1919-26 TO 1927-34	1920-26 TO 1927-33	1921-26 TO 1927-32	1922-26 TO 1927-31	CHANGE PER YEAR IN AVERAGE FROM: 1919-26 TO 1927-34	1920-26 TO 1927-33	1921-26 TO 1927-32	1922-26 TO 1927-31
Mining									
Percentage of income paid out									
Wages	72.8	— 8.7	— 8.1	— 7.3	— 6.4	— 1.1	— 1.2	— 1.2	— 1.3
Salaries	11.3	+ 4.7	+ 4.4	+ 3.9	+ 2.9	+ 0.6	+ 0.6	+ 0.6	+ 0.6
Number employed									
Wage earners (000's)	901	—216	—192	—125	— 93	— 27	— 27	—21	—19
Salaried employees (000's)	78	— 3	— 2	+ 1	+ 3	— 0.4	— 0.3	+ 0.2	+ 0.6
Average payment									
Wage ($)	1,415	—385	—403	—339	—256	— 48	— 58	—56	—51
Salary ($)	2,369	+ 33	— 4	+ 62	+101	+ 4	— 1	+10	+20
Manufacturing									
Percentage of income paid out									
Wages	62.0	— 7.6	— 7.6	— 7.0	— 6.5	— 1.0	— 1.1	— 1.2	— 1.3
Salaries	22.0	+ 4.7	+ 4.6	+ 4.2	+ 3.4	+ 0.6	+ 0.7	+ 0.7	+ 0.7
Number employed									
Wage earners (000's)	7,349	—885	—743	—428	—265	—111	—106	—71	—53
Salaried employees (000's)	1,275	+ 13	+ 43	+110	+135	+ 2	+ 6	+18	+27
Average payment									
Wage ($)	1,168	—116	—108	— 39	+ 6	— 14	— 15	— 6	+ 1
Salary ($)	2,350	+211	+204	+265	+315	+ 26	+ 29	+44	+63
Steam Railroads									
Percentage of income paid out									
Wages	55.7	— 8.1	— 7.2	— 5.6	— 4.3	— 1.0	— 1.0	— 0.9	— 0.9
Salaries	21.5	+ 1.8	+ 1.3	+ 0.6	+ 0.3	+ 0.2	+ 0.2	+ 0.1	+ 0.1
Number employed									
Wage earners (000's)	1,350	—412	—349	—242	—176	— 52	— 50	—40	—35
Salaried employees (000's)	400	— 84	— 73	— 54	— 37	— 10	— 10	— 9	— 7
Average payment									
Wage ($)	1,527	— 80	— 81	— 14	+ 38	— 10	— 12	— 2	+ 8
Salary ($)	1,943	+147	+114	+132	+156	+ 18	+ 16	+22	+31

within the salary-earning group is not smaller than that within the wage-earning. Then, in view of the difference between the average salary and wage, and so long as salaried employees are fewer than wage earners, the mere increase in the relative number of salaried workers to wage earners will tend to make the income distribution among all employees more unequal. Under the same conditions, such an increase in inequality will be further intensified by the growing disparity between the average wage and salary.

Dividend disbursements and interest payments

The distinction within the group of property incomes between dividend and interest payments is of potential significance from two aspects. First, it may throw light upon changes in the capital structure of industries, upon shifts between the rigid type of payment such as interest on long term debt (and only interest payments on long term debt are included among payments to individuals) and the more elastic type of obligation attaching to payment of dividends on capital stock. Second, a large share of total dividend disbursements goes to individuals in the high income categories, while a substantial share of interest payments on long term debt flows either to the lower income categories or to such all-inclusive 'associations of individuals' as life insurance companies and savings banks. Thus from the tabulation of income tax returns it appears that of total dividends disbursed to individuals in each of the years 1929-32 the proportion received by individuals reporting net income over $5,000 ranged from 71 per cent in 1929 to 58 per cent in 1932; the proportion of interest payments received by individuals in the same income categories ranged from only 23 per cent in 1929 to 10 per cent in 1932[8]

As with wages and salaries, so with dividend and interest payments, it is of little use to compare the short term changes in the percentage share of each in income paid out. The comparison would reveal only the well-known variability of dividend payments and the relative rigidity over short periods of interest payments on long term debt. But it is important to compare the general movement in the relative shares of dividends and of interest payments; to see whether there was over the period as a whole an appreciable shift towards the more fixed or the more elastic type of payment.

Table 8 brings together measures of the changes over the period in the percentage shares in income paid out of dividend disbursements and of interest payments on fixed debt, for each of the six industrial branches in which either type of payment is of sufficient importance to merit analysis. In addition, the movement of the relative share of these two types of payment are studied for the combined total of the nine industrial branches covered in this *Bulletin;* and, since the average relative shares of dividend and of interest payments differ appreciably within some industries, the change is measured not only in the percentages of net income but also in the absolute volume of the two types of payment. The change over the period was computed by the method employed in Tables 6 and 7, except that for the dollar volume of dividends and of interest payments the *percentage* instead of the *absolute* change is taken, and divided by the number of years to yield the change per year.

In all industries except steam railroads the rise in the percentage share of dividend payments is larger than in that of interest payments. As measured in dollar volume interest payments in manufacturing appear to have grown more than dividend payments; and the erratic measures for mining show only some preponderance towards a higher rate of change in dividends. However, for the nine industries combined, both the percentage share and the dollar volume of dividend disbursements rise more than the share and dollar volume of interest payments.

[8] See *National Income, 1929-1932,* Senate Doc. 124, 73d Cong., 2nd Sess., Table 30, p. 40.

SUMMARY

This *Bulletin* presents an analysis of the annual movement, from 1919 through 1934 of income produced and income paid out, by totals and by type of payment, for nine basic industrial branches of this country. In 1929 these branches accounted for about 60 per cent of the national income. The interpretation of any conclusions derived in the analysis of these nine industrial branches, which would attempt to extend them to national income as a whole, is, therefore, severely limited by the large relative weight and the distinctive character of the branches of the economic system that have been omitted. Nevertheless, the conclusions are of marked interest.

The comparison of income totals for the several industrial branches over the period has yielded the following results:

(a) Between income produced and paid out, the comparison within each industrial branch showed the former to have been subject to larger cyclical changes. Also, income produced revealed a lower rate of change over the period.

(b) In current dollars both income totals showed the most marked cyclical variability in mining, manufacturing and construction, followed closely by agriculture; and least variability in the electric light and power and gas and the communication industries. Adjustment for price changes of the product reduced considerably the cyclical variability of income totals in agriculture, manufacturing and mining; but had little effect in such public utilities as steam railroads and electric light and power and gas. Neither the adjustment for price changes of the product, nor, of course, the adjustment for changes in the purchasing power of the

TABLE 8

DIVIDEND DISBURSEMENTS AND INTEREST PAYMENTS, CHANGES OVER THE PERIOD IN PERCENTAGE SHARE AND DOLLAR VOLUME, BASIC INDUSTRIAL BRANCHES, 1919-1934

INDUSTRIAL BRANCH AND ITEM MEASURED	AVERAGE FOR 1919-34	TOTAL CHANGE IN AVERAGE FROM: 1919-26 TO 1927-34	1920-26 TO 1927-33	1921-26 TO 1927-32	1922-26 TO 1927-31	CHANGE PER YEAR IN AVERAGE FROM: 1919-26 TO 1927-34	1920-26 TO 1927-33	1921-26 TO 1927-32	1922-26 TO 1927-31
Mining									
Percentage of income paid out									
Dividends	11.9	+ 2.8	+ 2.5	+ 2.6	+ 3.2	+ 0.4	+ 0.4	+ 0.4	+ 0.6
Interest	2.5	+ 1.3	+ 1.3	+ 0.8	+ 0.4	+ 0.2	+ 0.2	+ 0.1	+ 0.1
Dollar volume of payments									
Dividends	212	— 8.1	+ 8.4	+ 0.4	+ 9.8	— 1.0	+ 1.2	+ 0.1	+ 2.0
Interest	40	+ 5.1	+ 2.4	— 2.3	— 2.3	+ 0.6	+ 0.3	— 0.4	— 0.5
Electric Light and Power and Gas									
Percentage of income paid out									
Dividends	32.1	+ 9.9	+ 10.3	+ 9.8	+ 8.3	+ 1.2	+ 1.5	+ 1.6	+ 1.7
Interest	25.2	+ 4.6	+ 3.6	+ 2.1	+ 0.9	+ 0.6	+ 0.5	+ 0.4	+ 0.2
Dollar volume of payments									
Dividends	334	+152.9	+146.5	+134.0	+111.4	+19.1	+20.9	+22.3	+22.3
Interest	253	+120.9	+107.2	+ 88.8	+ 69.1	+15.1	+15.3	+14.8	+13.8
Manufacturing									
Percentage of income paid out									
Dividends	12.5	+ 2.9	+ 2.9	+ 2.8	+ 3.2	+ 0.4	+ 0.4	+ 0.5	+ 0.6
Interest	1.3	+ 0.7	+ 0.7	+ 0.5	+ 0.4	+ 0.1	+ 0.1	+ 0.1	+ 0.1
Dollar volume of payments									
Dividends	1,751	+ 18.3	+ 20.6	+ 28.5	+ 35.0	+ 2.3	+ 2.9	+ 4.8	+ 7.0
Interest	164	+ 58.3	+ 53.4	+ 50.4	+ 49.6	+ 7.3	+ 7.6	+ 8.4	+ 9.9
Steam Railroads									
Percentage of income paid out									
Dividends	7.0	+ 1.2	+ 1.5	+ 2.0	+ 2.8	+ 0.2	+ 0.2	+ 0.3	+ 0.6
Interest	14.4	+ 4.4	+ 3.8	+ 2.3	+ 0.8	+ 0.6	+ 0.5	+ 0.4	+ 0.2
Dollar volume of payments									
Dividends	269	+ 5.7	+ 13.7	+ 25.9	+ 39.2	+ 0.7	+ 2.0	+ 4.3	+ 7.8
Interest	504	+ 4.3	+ 3.8	+ 3.9	+ 2.5	+ 0.5	+ 0.5	+ 0.6	+ 0.5
Other Transportation									
Percentage of income paid out									
Dividends	9.1	+ 3.3	+ 4.1	+ 4.3	+ 3.3	+ 0.4	+ 0.6	+ 0.7	+ 0.7
Interest	10.3	0.0	— 0.4	— 1.3	— 1.9	0.0	— 0.1	— 0.2	— 0.4
Dollar volume of payments									
Dividends	104	+ 21.3	+ 33.3	+ 42.1	+ 33.7	+ 2.7	+ 4.8	+ 7.0	+ 6.7
Interest	116	— 20.2	— 20.0	— 21.2	— 21.2	— 2.5	— 2.9	— 3.5	— 4.2
Communication									
Percentage of income paid out									
Dividends	17.1	+ 7.4	+ 6.6	+ 5.0	+ 3.4	+ 0.9	+ 0.9	+ 0.8	+ 0.7
Interest	5.7	— 0.8	— 1.0	— 1.1	— 1.2	— 0.1	— 0.1	— 0.2	— 0.2
Dollar volume of payments									
Dividends	122	+115.6	+101.2	+ 83.7	+ 65.2	+14.4	+14.5	+14.0	+13.0
Interest	38	+ 23.5	+ 17.1	+ 11.4	+ 5.7	+ 2.9	+ 2.4	+ 1.9	+ 1.1
Total of 9 Industrial Branches									
Percentage of income paid out									
Dividends	8.1	+ 2.5	+ 2.6	+ 2.5	+ 2.5	+ 0.3	+ 0.4	+ 0.4	+ 0.5
Interest	4.0	+ 1.3	+ 1.2	+ 0.8	+ 0.3	+ 0.2	+ 0.2	+ 0.1	+ 0.1
Dollar volume of payments									
Dividends	3,211	+ 24.2	+ 27.1	+ 34.1	+ 38.9	+ 3.0	+ 3.9	+ 5.7	+ 7.8
Interest	1,540	+ 19.0	+ 17.6	+ 15.9	+ 13.6	+ 2.4	+ 2.5	+ 2.6	+ 2.7

NOTE: In the percentage of dividends and interest payments to income paid out, the total change is computed as the *absolute* change from the average for the first segment of the period to the average for the second segment. In the dollar volume of payments the average for 1919-34 is in millions of dollars, and the total change is computed as the *percentage* rise or decline from the average for the first segment of the period to the average for the second segment. There is a corresponding difference in the change per year between the percentage of dividends and interest payments to income paid out and the dollar volumes of these payments.

product affected much the relative standing of the several industrial branches with respect to the cyclical variability of their income totals.

(c) In current dollars both income produced and paid out declined over the period in most industries, rising only in two: electric light and power and gas and communication. Income produced, in current dollars declined most markedly in agriculture, mining and street railways; least in trade and manufacturing. Adjustment for changes in purchasing power raised the rate of change in all the industries, but of course affected little their standing with respect to it. However, when the totals were adjusted for price changes of the products, the rate of change in agriculture, mining and manufacturing was raised, and the rate in the electric light and power and gas, and the telephone industries was lowered somewhat. Consequently, the physical equivalent of net income produced, the result of the adjustment, declined only in street railways and steam railroads; in agriculture, mining and manufacturing it rose; but the most conspicuous rise was still in the electric light and power and gas and the telephone industries.

(d) The comparison of the income totals when adjusted for price changes and for changes in the purchasing power of the product suggested that the differential movement over the period of the specific price levels improved the terms of exchange for the income recipients in such public utilities as electric light and power and gas, communication, and steam railroads; and affected unfavorably the terms of this exchange for the income recipients in such industries as agriculture, mining and manufacturing.

The analysis of changes in the percentage allocation of net income paid out by types of payment suggests the following conclusions:

(e) Of the three major types of payment the percentage share of the compensation of employees tended to rise and decline with the cyclical rises and declines in income paid out; while the percentage share of each of the other two types of payment, withdrawals by entrepreneurs and the combined item of dividends and interest payments, tended to move in a direction opposite to the cyclical fluctuations in income paid out. This conclusion holds especially for the short cycles in income paid out.

(f) The percentage share of compensation of employees declined distinctly over the period as a whole in all industrial branches, except construction and trade, and in the combined total for the nine industries. Similarly, the percentage share of withdrawals by entrepreneurs declined over the period in most industries and in the combined total for the nine industries. By contrast, the percentage share of the combined dividends and interest payments rose distinctly over the period as a whole in each industrial branch, and in the combined total for the nine industries.

(g) For the three industrial branches for which segregation of wages and salaries was possible—mining, manufacturing and steam railroads—the percentage share of wages in income paid out declined over the period as a whole; the percentage share of salaries rose. This differential movement in the percentage shares of wages and salaries was accompanied by a relative increase in the proportion of salaried workers to wage earners employed and by an increasing disparity between the average wage and salary.

(h) Both dividend disbursements and interest payments on long term debt tended, over the period as a whole, to account for an increasing percentage of income paid out. But this rise appeared larger in dividend disbursements, and, similarly, the absolute amount of dividend payments in the nine industries analyzed appeared to have increased more over the period than the absolute amount of interest payments.

These conclusions and their interpretation are subject to the qualifications emphasized above. In addition, their confirmation must await the completion of the study now in progress at the National Bureau which will supply estimates for the branches of the economic system that are not covered in this *Bulletin*. It is hoped that it will also provide a more finely graded classification of the national income than the one used above. Both these amplifications of the data used in this *Bulletin* will make possible a fuller exploration of the conclusions suggested.

Finally, the conclusions have been derived for a period that has several peculiarities, a period that begins with the violent economic adjustments immediately following the War, covers the prosperous 1920's, the great depression of 1930-32, and ends with an irregular revival. Whether the differences noted in the cyclical variability of income totals among the several industries or among the various types of payment are true of other periods, it is impossible to say without extending the analysis to other years and bringing it into more closely articulated relation to the body of accumulated knowledge in the field. Whether the differences in the movement over the period among the nine income totals or among the relative shares of the various types of payment are true only of this period, are typical of any similar post-war decline in the general price level, or reflect secular tendencies of a longer duration, would be possible to state only upon a study of other historical periods and a more detailed analysis of the factors at play.

Appendix Table 1

INCOME PRODUCED AND INCOME PAID OUT BY INDUSTRIAL SOURCES, 1919-1934

(millions of dollars)

	1919	1920	1921	1922	1923	1924	1925	1926	1927	1928	1929	1930	1931	1932	1933	1934
A. AGRICULTURE																
Wages[1]	1,492	1,713	1,097	1,068	1,208	1,189	1,236	1,282	1,295	1,304	1,313	1,112	807	523	484	518
Withdrawals by farm operators	6,648	7,659	5,104	4,882	5,415	5,506	5,559	5,668	5,626	5,614	5,649	5,120	4,022	3,075	2,871	3,232
Interest on mortgages (incl. small amount of dividends)	337	382	388	397	396	396	399	398	407	405	388	370	364	345	324	278
Income paid out	8,477	9,754	6,589	6,347	7,019	7,091	7,194	7,348	7,328	7,323	7,350	6,602	5,193	3,943	3,679	4,028
Net business savings or losses[2]	3,282	—260	10	—198	—9	536	889	290	247	381	301	—730	—1,450	—1,569	—571	—7
Income produced	11,759	9,494	6,599	6,149	7,010	7,627	8,083	7,638	7,575	7,704	7,651	5,872	3,743	2,374	3,108[3]	4,021[3]
B. MINING																
Wages	1,393	1,992	1,448	1,339	1,932	1,616	1,507	1,758	1,546	1,367	1,405	1,173	805	529	533	708
Salaries	156	223	150	161	200	191	197	225	218	201	226	226	183	134	129	169
Wages and salaries	1,548	2,215	1,598	1,500	2,133	1,806	1,704	1,983	1,765	1,568	1,631	1,399	987	663	662	877
Dividends	195	210	193	139	223	213	269	327	278	253	365	249	138	82	75	183
Interest	23	30	38	33	37	51	54	47	44	42	42	43	43	41	39	36
Property income	218	240	231	172	261	264	323	373	322	295	407	292	181	122	114	219
Withdrawals by entrepreneurs	30	39	32	31	34	29	27	26	25	23	21	20	18	14	14	15
Income paid out	1,796	2,494	1,861	1,703	2,428	2,099	2,054	2,382	2,111	1,886	2,059	1,712	1,186	799	790	1,111
Net business savings or losses[2] [4]	4.3	179	—462	—150	—296	—298	—54	—80	—269	—145	—152	—303	—399	—312	—255	—55
Income produced[4]	1,800	2,673	1,399	1,553	2,132	1,801	2,000	2,303	1,842	1,741	1,907	1,409	787	487	535	1,056
C. ELECTRIC LIGHT AND POWER AND MANUFACTURED GAS																
Wages and salaries	217	261	263	274	346	400	415	464	480	508	533	528	473	379	350	376
Dividends	112	111	112	149	201	241	287	302	339	430	514	605	609	520	431	379
Interest	93	101	112	130	158	194	218	254	278	307	318	340	371	404	407	370
Property income	205	212	224	279	358	435	505	556	617	738	832	944	980	924	839	749
Withdrawals by entrepreneurs	4.0	4.0	3.7	3.2	2.8	2.6	2.3	1.9	1.5	1.4	1.2	1.0	0.8	0.6	0.6	0.5
Income paid out	426	477	491	556	707	837	922	1,022	1,098	1,247	1,367	1,474	1,453	1,304	1,189	1,126
Net business savings or losses[2] [4]	—1.2	19	33	64	72	43	148	132	150	160	197	141	46	—44	—50	—40
Income produced[4]	425	496	524	620	778	880	1,070	1,154	1,248	1,407	1,564	1,614	1,500	1,260	1,139	1,086
D. MANUFACTURING																
Wages	9,682	11,587	7,460	7,990	10,160	9,494	9,981	10,318	10,115	10,201	10,899	8,842	6,701	4,636	4,940	6,304
Salaries	2,786	3,114	2,431	2,474	2,862	2,895	2,979	3,229	3,424	3,665	4,013	3,866	3,206	2,424	2,205	2,612
Wages and salaries	12,468	14,701	9,892	10,464	13,022	12,389	12,960	13,547	13,539	13,866	14,912	12,709	9,908	7,060	7,145	8,916
Dividends	1,262	1,489	1,325	1,311	1,764	1,653	1,911	2,119	2,228	2,509	2,578	2,618	1,897	1,117	1,011	1,217
Interest	86	108	138	106	118	155	154	152	154	185	212	237	238	209	193	178
Property income	1,348	1,596	1,464	1,417	1,882	1,807	2,065	2,271	2,383	2,695	2,790	2,856	2,134	1,326	1,203	1,395
Withdrawals by entrepreneurs	475	483	377	375	358	356	358	350	338	333	333	300	246	181	167	198
Income paid out	14,292	16,780	11,732	12,255	15,262	14,553	15,383	16,168	16,260	16,893	18,035	15,864	12,288	8,567	8,516	10,509
Net business savings or losses[2] [4]	2,781	1,026	—1,918	1,196	1,652	869	1,501	1,201	542	1,058	1,473	—1,858	—3,029	—3,182	—1,021	393
Income produced[4]	17,073	17,807	9,814	13,451	16,913	15,422	16,884	17,369	16,803	17,952	19,507	14,006	9,258	5,385	7,495	10,901
E. CONTRACT CONSTRUCTION																
Wages and salaries	1,235	1,759	1,288	1,535	2,230	2,243	2,232	2,540	2,456	2,567	2,521	2,159	1,415	643	542	638
Dividends	15	21	32	30	37	32	58	41	47	51	62	83	39	21	19	15
Interest	3.3	3.8	6.0	2.9	5.1	7.3	9.9	11	11	9.5	13	15	13	10	8.7	8.4
Property income	18	24	38	33	42	39	68	52	58	61	74	98	52	31	27	23
Withdrawals by entrepreneurs	287	308	295	406	383	420	552	359	395	435	436	261	176	159	225	276
Income paid out	1,540	2,092	1,621	1,973	2,656	2,702	2,852	2,951	2,909	3,063	3,031	2,518	1,644	833	794	938
Net business savings or losses[2] [4]	114	54	—44	34	67	140	130	115	97	84	77	—37	—99	—204	—172	—44
Income produced[4]	1,654	2,146	1,577	2,007	2,723	2,843	2,982	3,065	3,006	3,147	3,108	2,481	1,545	629	623	893
F. STEAM RAILROADS, PULLMAN AND EXPRESS																
Wages, including gratuities[5]	2,462	3,215	2,269	2,116	2,472	2,289	2,324	2,403	2,346	2,264	2,332	1,998	1,584	1,122	1,060	1,165
Salaries[5]	675	865	819	837	870	871	877	893	900	892	895	852	749	564	501	525
Compensation for injuries and pensions	36	52	35	37	44	46	56	61	62	57	59	59	57	52	52	54
Compensation of employees	3,173	4,132	3,123	2,990	3,387	3,206	3,256	3,356	3,308	3,213	3,286	2,909	2,390	1,738	1,612	1,744
Dividends	257	236	209	226	253	277	295	337	437	367	439	435	257	75	76	121
Interest	436	461	477	489	501	525	537	528	528	528	520	535	536	531	478	461
Property income	693	698	685	714	753	802	832	865	965	894	959	970	793	606	554	582
Income paid out	3,865	4,830	3,808	3,704	4,140	4,009	4,088	4,221	4,273	4,108	4,245	3,879	3,183	2,344	2,166	2,326
Net business savings or losses[6]	58	—6.5	—5.2	106	282	243	382	429	176	359	393	—22	—219	—261	—52	—111
Income produced	3,924	4,823	3,803	3,810	4,422	4,251	4,470	4,650	4,449	4,467	4,638	3,858	2,964	2,083	2,115	2,215

NOTE: For all industries, except agriculture, the items have been estimated in thousands of dollars. Hence the rounded figures given here for these industries do not always add up exactly to the totals shown of income paid out and produced.

Appendix Table 1 (*Cont.*)

	1919	1920	1921	1922	1923	1924	1925	1926	1927	1928	1929	1930	1931	1932	1933	1934
G. OTHER TRANSPORTATION (PIPE LINES, STREET RAILWAYS AND WATER TRANSPORTATION)																
Wages and salaries	937	1,262	1,048	963	995	1,027	1,007	1,034	1,001	998	1,007	941	805	632	579	628
Dividends	102	78	67	104	93	89	116	103	122	127	143	160	125	133	56	49
Interest	122	121	128	139	145	138	125	114	105	105	104	104	103	104	102	98
Property income	224	199	194	242	239	227	241	217	227	232	247	264	228	237	158	148
Withdrawals by entrepreneurs	9.7	6.7	4.7	4.8	4.7	3.5	4.2	4.3	4.0	4.6	4.6	4.6	3.3	2.3	1.8	2.0
Income paid out	1,171	1,467	1,247	1,210	1,239	1,257	1,252	1,256	1,231	1,235	1,258	1,209	1,036	872	738	778
Net business savings or losses[2] [4]	44	70	3.0	3.3	35	33	33	38	14	31	43	—68	—84	—130	—40	—50
Income produced[4]	1,215	1,538	1,250	1,213	1,274	1,291	1,285	1,293	1,245	1,266	1,301	1,141	952	742	699	728
Income paid out, street railways	513	605	580	605	616	610	593	580	558	542	545	506	444	369	324	332
Income produced, street railways	525	627	609	621	641	616	604	584	563	534	533	473	402	330	298	310
H. COMMUNICATION																
Wages and salaries	307	404	402	426	471	504	527	567	586	625	702	710	635	529	455	477
Pensions and benefits	4.1	5.4	5.4	6.0	6.1	6.0	6.6	7.2	7.6	8.3	9.3	9.6	11	10	9.9	11
Compensation of employees	311	409	408	432	477	510	534	574	593	634	711	719	646	540	465	489
Dividends	51	51	58	70	81	92	103	112	125	130	146	171	188	191	188	187
Interest	29	33	36	29	32	33	41	41	42	37	36	34	37	48	50	51
Property income	80	84	94	99	113	125	144	153	167	167	181	204	225	239	238	238
Income paid out	391	493	502	532	590	634	677	728	760	801	892	924	871	779	703	727
Net business savings or losses[6]	26	21	30	47	47	43	69	76	81	102	109	46	12	—54	—67	—59
Income produced	417	514	532	578	636	677	746	804	841	902	1,001	970	883	724	636	667
Income paid out, telephones	311	388	410	442	493	537	574	608	642	680	752	778	751	693	631	646
Income produced, telephones	325	397	433	473	525	566	623	668	701	759	844	828	767	647	560	587
I. TRADE																
Wages and salaries	5,978	6,423	5,498	5,917	6,672	6,785	7,169	7,518	7,336	7,445	7,797	7,431	6,448	4,967	4,363	4,822
Dividends	401	382	320	302	369	390	440	471	495	499	566	497	386	214	179	214
Interest	33	42	40	39	22	31	31	25	31	43	56	59	66	61	49	45
Property income	434	424	360	341	391	420	471	496	526	542	621	556	452	275	228	260
Withdrawals by entrepreneurs	2,086	2,438	2,015	1,926	1,968	2,061	2,039	2,106	2,097	2,128	2,232	2,185	2,017	1,771	1,648	1,717
Income paid out	8,498	9,284	7,873	8,184	9,031	9,267	9,679	10,120	9,959	10,116	10,650	10,172	8,917	7,013	6,239	6,799
Net business savings or losses[2] [4]	2,864	372	—864	827	1,234	762	907	593	464	717	241	—1,181	—1,761	—1,884	—414	—67
Income produced[4]	11,362	9,657	7,009	9,011	10,265	10,029	10,586	10,712	10,424	10,833	10,891	8,991	7,156	5,128	5,825	6,733

[1] Includes board and perquisites.

[2] After payment of dividends and withdrawals by individual entrepreneurs.

[3] Exclusive of rental and benefit payments amounting to $278 million in 1933 and $594 million in 1934.

[4] As adjusted for profits and losses on sale of assets, net business savings and income produced in millions of dollars since 1929 are as follows:

	1929	1930	1931	1932	1933	1934
B. MINING						
Net business savings or losses	—184	—337	—386	—293	—240	—52
Income produced	1,875	1,375	800	506	550	1,060
C. ELECTRIC LIGHT AND POWER AND MANUFACTURED GAS						
Net business savings or losses	197	141	49	—43	—43	—35
Income produced	1,564	1,614	1,503	1,262	1,146	1,091
The figures for the electric light and power industry are based on Census data and are for operating companies only. Their profits and losses from sale of assets cannot be estimated.						
D. MANUFACTURING						
Net business savings or losses	1,431	—1,784	—2,807	—2,953	—761	313
Income produced	19,466	14,081	9,480	5,615	7,755	10,822
E. CONTRACT CONSTRUCTION						
Net business savings or losses	68	—23	—72	—185	—155	—40
Income produced	3,099	2,495	1,572	648	640	898
G. OTHER TRANSPORTATION (PIPE LINES, STREET RAILWAYS AND WATER TRANSPORTATION)						
Net business savings or losses	42	—66	—75	—127	—31	—37
Income produced	1,299	1,143	961	745	707	740
I. TRADE						
Net business savings or losses	183	—1,124	—1,577	—1,782	—304	—49
Income produced	10,833	9,048	7,340	5,230	5,935	6,750

[5] Owing to the reclassification of railroad employees, the 1932-34 figures are not strictly comparable with the earlier years. Figures comparable with 1932-34 for 1929-31 are given below.

(millions of dollars)

	1929	1930	1931
Wages	2,347	2,011	1,596
Salaries	880	838	737

[6] After payment of dividends.

APPENDIX TABLE 2

INDEXES OF PHYSICAL VOLUME OF OUTPUT

(1919-34=100.0)

YEAR	(1) AGRICULTURE [1]	(2) MINING [2]	(3) ELECTRIC LIGHT AND POWER AND GAS [3]	(4) MANUFACTURING [4]	(5) CONSTRUCTION [5]	(6) STEAM RAILROAD TRANSPORTATION [6]	(7) STREET RAILWAYS [7]	(8) TELEPHONES [8]
1919	90.1	81.4	58.7	88.6	81.5	108.4	108.9	65.3
1920	94.2	91.2	63.7	93.9	74.0	119.1	113.5	69.4
1921	85.9	75.7	60.4	73.5	86.9	90.4	106.4	74.4
1922	95.2	79.8	68.4	92.1	111.6	96.6	111.9	82.3
1923	98.3	109.1	80.4	104.5	116.7	114.5	114.3	88.8
1924	100.4	104.2	84.6	99.2	119.2	108.0	111.8	93.7
1925	100.4	106.7	93.2	109.8	130.0	113.5	110.7	99.7
1926	105.6	115.6	105.4	115.1	131.5	120.0	111.2	106.4
1927	102.5	118.1	114.5	115.1	137.5	115.5	108.8	111.9
1928	107.7	118.1	123.1	124.0	148.1	115.2	106.0	118.9
1929	104.6	128.7	134.9	132.0	137.4	118.1	104.9	128.4
1930	104.6	114.0	132.5	111.6	114.5	101.2	93.6	126.2
1931	110.8	96.9	127.6	95.7	86.4	81.8	84.8	121.1
1932	103.5	79.8	114.3	73.5	44.0	62.1	72.2	108.5
1933	100.4	86.3	115.4	82.4	38.1	65.1	67.8	100.9
1934	95.2	93.6	123.0	88.6	42.5	70.5	71.4	104.1

[1] Based on estimates of production for sale or consumption in the farm home. Calendar year for livestock is combined with crop production of the same year.

[2] Covers the following mineral products: petroleum; bituminous coal; anthracite coal; natural gas; copper; sand, gravel and building stone; iron ore; lead; zinc; lime and cement materials; gypsum; gold; silver; aluminum; sulphur; salt; slate. Weights are based upon the value of products in the years 1925-29. In apportioning weights and in selecting commodities care was taken to avoid duplication between the minerals and manufactures index numbers. The index is that given for the years 1927-34 in Table 3 of *Bulletin 58* and was prepared by Charles A. Bliss.

[3] Weighted average of kilowatt hours of electricity and cubic feet of gas.

[4] Based on Census of Manufactures data. The index has been adjusted to represent all manufacturing industries by applying to the percentage change in number of wage earners and value added reported by all establishments the change in the appropriate ratio of these items to the index of physical output of the industries included in the sample (see *Economic Tendencies,* pp. 250, 307, 560-71). The index numbers for even-numbered years are interpolations. The index was prepared by Charles A. Bliss.

[5] Volume of construction deflated by a construction costs index.

[6] Weighted average of freight ton miles and passenger miles.

[7] Passengers carried.

[8] Weighted average of exchange and toll connections.

APPENDIX TABLE 3

INDEXES REFLECTING CHANGES IN PURCHASING POWER

(1919-34=100.0)

YEAR	PRICES OF CAPITAL GOODS [1]	COST OF LIVING [2]	PRICES OF FINISHED GOODS [3]	YEAR	PRICES OF CAPITAL GOODS [1]	COST OF LIVING [2]	PRICES OF FINISHED GOODS [3]
1919	116.0	104.2	105.4	*1931*	91.5	92.3	92.2
1920	133.9	120.5	121.8	*1932*	81.8	83.3	83.2
1921	103.8	108.2	107.8	*1933*	82.1	78.6	79.0
1922	93.9	100.6	99.9	*1934*	90.0	81.3	82.2
1923	106.1	102.9	103.2				
1924	102.7	103.0	103.0				
1925	100.0	105.5	105.0				
1926	100.0	106.7	106.0				
1927	100.9	105.5	105.0				
1928	98.8	103.3	102.8				
1929	101.3	103.1	102.9				
1930	97.4	100.9	100.6				

[1] Weighted average of available prices of various types of capital equipment and construction, prepared by Solomon Fabricant.

[2] B.L.S. index. The index for the calendar year was obtained by taking an average of the December figure for the preceding year, the December figure and the June figure for the given year, the latter being given double weight. The 1934 figures were for June and November.

[3] Average of the index of prices of capital goods and of the cost of living, with respective weights of 1 and 9.