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**CORRUGATED AND SOLID FIBER BOXES  
INDUSTRY, 1958-66**

# INDEXES OF OUTPUT PER MAN-HOUR

**BULLETIN 1641**

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PER MAN-HOUR**

**Corrugated and Solid Fiber Boxes  
Industry, 1958-66**



December 1969

**U.S. DEPARTMENT OF LABOR  
George P. Shultz, Secretary**

**BUREAU OF LABOR STATISTICS  
Geoffrey H. Moore, Commissioner**



## Preface

The Bureau of Labor Statistics has been publishing measures of output per man-hour for selected industries for many years. These measures appear in Indexes of Output Per Man-Hour, Selected Industries, 1939 and 1947-67 (BLS Bulletin 1612), December 1968. This report presents indexes for the corrugated and solid fiber boxes industry for the first time. Earlier reports in the paper and allied products group covered paper, paperboard, pulp, and building board mills.

The study was prepared by Carolyn S. Fehd, assisted by John W. Ferris, Jr., Office of Productivity, Technology, and Growth, Division of Industry Productivity Studies.



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# Indexes of Output Per Man-Hour: Corrugated and Solid Fiber Boxes Industry, 1958—66

## Introduction

Measuring productivity change is one way to determine whether resources are being used efficiently. If output per man-hour is increasing, then more goods are being produced per unit of labor input and the economy is potentially richer. Thus, knowledge of the degree and direction of productivity movements is essential for those responsible for encouraging economic growth.

Industry productivity measures have several valuable uses. By combining these measures with other industry data, one can study the effects of changes in manpower utilization, project future manpower requirements, analyze trends in labor costs, compare productivity progress among countries, and examine the impact of technological improvements on employment.

The measures presented in this report relate output to one input—man-hours. They do not measure the specific contribution of labor, capital, or any other single factor. Rather, they reflect the joint effect of a number of interrelated influences such as changes in technology, capital investment per worker, capacity utilization, layout and flow of operations, skill and effort of the work force, managerial ability, and labor-management relations.

These measures are subject to certain limitations. Because of the difficulties of measuring quality change, of maintaining consistent coverage between output and labor input, of reflecting changes in the degree of plant integration and specialization, and other statistical limitations, productivity indexes should be regarded as general rather than specific indications of output per man-hour movements.

This report presents measures of output per man-hour for the corrugated and solid fiber boxes industry. The indexes for this industry begin with 1958 since annual data on man-hours were not available earlier; in addition, product detail for earlier years was not strictly comparable with later years. The report includes some analysis of trends in output per man-hour and related series as well as an outline of technological developments that have occurred in the industry. It also contains a detailed technical note which describes the data sources and statistical techniques utilized.

## General Characteristics

The corrugated and solid fiber boxes industry comprises establishments engaged primarily in manufacturing corrugated and solid fiber boxes and related products from paperboard and fiber stock.<sup>1</sup> This industry is designated Industry 2653 in the 1967 Standard Industrial Classification Manual and is included in SIC Group 265, paperboard containers and boxes.

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<sup>1</sup> The paperboard is either purchased from other companies or manufactured by other establishments of the same company (interplant transfers). In 1963, about 55 percent of the paperboard used came from interplant transfers.

The industry's major product—corrugated boxes—accounts for about 95 percent of the industry's shipments.<sup>2</sup> The remainder includes solid fiber boxes, corrugated paperboard, and corrugated and solid fiber pallets, pads, and partitions. Manufacturers of food, paper, and glass containers are the major users of the industry's products.

In 1966, the corrugated box industry employed about 96,000, or 36 percent more than the number employed in 1958. Production workers increased 37 percent, from about 54,000 in 1958 to over 73,000 in 1966. (See table 1.)

In 1963, the last year for which figures are available on the number of establishments, the corrugated box industry employed more than 80,000 people in over 900 establishments or an average of 90 employees per establishment. About 75 percent of the employees were production workers; this proportion has changed little since 1958 and is close to the average for all manufacturing.

Establishments which employed 100 persons or more in 1963 accounted for over 75 percent of the workers; about 27 percent were in establishments which employed 250 persons or more.

The Fibre Box Association distinguishes independent companies from combined companies. Independent companies buy 50 percent or more of the paperboard they use, while combined companies manufacture 50 percent or more of their paperboard. In 1966, combined companies accounted for 75 percent of the industry's total shipments. Combined companies became increasingly important between 1958 and 1966.

Over 500 companies own the 900 plus establishments that make up the industry. (See table 1.) In 1966, the four largest companies accounted for about 18 percent of the industry's total shipments.

Establishments are spread throughout the country; all but five States have at least one. However, over one-half of all establishments and over one-half of those employing 100 persons or more are located in the eight Middle Atlantic and East North Central States. The nearly 500 establishments in these two regions account for over one-half the total employment and value of shipments in the industry.

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<sup>2</sup> For convenience, the industry will be referred to as the corrugated box industry.

Table 1. Corrugated and Solid Fiber Boxes Industry: General Characteristics, 1958-66

Item	Unit	1958	1959	1960	1961	1962	1963	1964	1965	1966 <sup>1</sup>
Establishments -----	Number	805	( <sup>2</sup> )	( <sup>2</sup> )	( <sup>2</sup> )	( <sup>2</sup> )	923	( <sup>2</sup> )	( <sup>2</sup> )	( <sup>2</sup> )
Total employment -----	-do-	70,792	77,766	79,896	79,727	83,264	83,229	86,382	90,547	96,064
Production workers -----	-do-	53,531	59,602	60,920	60,584	63,680	62,800	64,710	67,645	73,326
Nonproduction workers -----	-do-	17,261	18,164	18,976	19,143	19,584	20,429	21,672	22,902	22,738
Ratio of production workers to all employees -----	Percent	75.6	76.6	76.2	76.0	76.5	75.5	74.9	74.7	76.3
Employees per establishment -----	Number	87.9	( <sup>2</sup> )	( <sup>2</sup> )	( <sup>2</sup> )	( <sup>2</sup> )	90.2	( <sup>2</sup> )	( <sup>2</sup> )	( <sup>2</sup> )
Production workers per establishment -----	-do-	66.5	( <sup>2</sup> )	( <sup>2</sup> )	( <sup>2</sup> )	( <sup>2</sup> )	68.0	( <sup>2</sup> )	( <sup>2</sup> )	( <sup>2</sup> )
Capital expenditures (new) -----	\$ millions	52.0	59.5	54.8	50.8	65.2	54.1	71.6	93.6	117.2
Capital expenditures per employee -----	Dollars	734	765	686	637	783	650	829	1,034	1,220
Value of shipments (total) -----	\$ millions	1,636	1,905	1,937	1,971	2,179	2,166	2,346	2,559	2,891
Cost of materials (total) -----	-do-	1,042	1,229	1,250	1,255	1,371	1,368	1,516	1,626	1,806
Value added -----	-do-	597	678	686	709	806	804	831	933	1,091
Wages and salaries -----	-do-	345	408	418	440	474	486	534	578	635
Wages -----	-do-	234	276	281	294	320	324	355	389	428
Salaries -----	-do-	111	131	137	146	154	162	179	189	207

<sup>1</sup> Preliminary.<sup>2</sup> Not available.

Source: Bureau of the Census, U. S. Department of Commerce.

## Trends in Productivity, Output, and Employment

Corrugated box manufacture has grown steadily since 1958. Output, employment, and man-hours all increased between 1958 and 1966. (See tables 2-4 and charts 1-4.)

Output per man-hour for the corrugated box industry rose slowly between 1958 and 1966. The average annual increase of 2.9 percent<sup>3</sup> was lower than the 3.8 percent rate attained for all manufacturing. Nevertheless, it reported continued growth as output per man-hour increased every year except 1960; above average increases occurred in 1961 and 1963. By 1966, the output per man-hour index was 23.5 percent higher than it was in 1958. (See appendix for rates of change.)

The average annual increase of output per production worker man-hour from 1958 to 1966 was at the same rate, 2.9 percent, as was output per all employee man-hour. However, year-to-year changes in output per production worker man-hour are more erratic.

The output of the corrugated box industry increased at the average annual rate of 6.6 percent from 1958 to 1966. Except for 1961, the industry followed the same general trend as that for all manufacturing, though the industry's rate of increase was slightly higher than the 6.1 percent per year for all manufacturing.

Employment and man-hours increased less rapidly than output. Employment increased 3.2 percent per year, while man-hours increased 3.6 percent per year during the same period. The greater increase in man-hours over employment reflects some increase in average annual hours worked.

### Factors Affecting Productivity

Productivity movements generally result from the interrelated effects of changes in output, capital investment, and technology. These three factors influenced, in varying degrees, productivity in the corrugated box industry between 1958 and 1966.

The output increase of 6.6 percent a year was probably one of the more important factors in increased productivity. This growth, in turn, was caused partly by the steady gains in manufacturing output during this period since higher output of manufactured products inevitably led to a greater demand for shipping containers.

Changes in the product, such as increased and more elaborate printing on boxes, also may have contributed to the change in output by enlarging demand for a more attractive product. At the same time, such a development may have had a negative impact on productivity by increasing labor requirements. The 1963 census showed a 31 percent increase over 1958 in production employees engaged in design and printing activities, compared with an increase of only 18 percent for all employees.

Expenditures on new capital equipment tend to promote the use of more modern equipment which usually increases productivity. Capital expenditure per employee was somewhat irregular over the 1958-66 period. (See table 1.) Overall, the rate in current dollars increased 66 percent since 1958, and the increase has been steady since 1963.

Changes in the manufacturing process also have affected productivity. Although machinery for making corrugated board has changed little over the past 40 years, improvements in handling rolling stock and in gluing have made new corrugators much faster. Individual operations have been mechanized for many years but improvements in layout to link and coordinate them contributed to increased productivity.

<sup>3</sup> Average annual rates in this report are based on the linear least squares trends of the logarithms of the index numbers.

Technological advances probably will influence the industry's productivity as they become more widely used. For many years, the corrugated board blank was made separately and seven additional steps were needed to complete a box:

1. Slitting the blank to the proper width
2. Scoring the blank the long way
3. Scoring the blank the short way
4. Putting in slots
5. Printing
6. Closing
7. Bundling

Each step was done on a separate machine as employees moved the corrugated board between machines. New innovations combine several steps on one machine. For example, the corrugator now slits the blank the proper width and scores the blank the long way, while one or two other machines do the remaining steps.

Some of the newer developments are: (1) Flexograph printing, which uses instant drying aniline ink to eliminate the drying period needed for conventional ink; (2) hot melted glue, which has replaced some tape and stitching in closing the box because it sets quickly; and (3) rotary steel dies, which replace the conventional flatbed process in the cutting and creasing of paperboard and may double the speed of production by providing greater design flexibility and cutting and folding accuracy. Companies also are experimenting with the shape of the fluting in the hope of speeding up the manufacturing process and increasing the strength of boxes. So far, many of these innovations have not been widely adopted. Therefore, the full impact of these developments has not yet been reflected in the productivity data.

Table 2. Corrugated and Solid Fiber Boxes Industry: Output Per Man-Hour, Unit Labor Requirements, and Related Data, All Employees, 1958-66

Indexes (1958 = 100)

Year	Output per—		Unit labor require- ments in terms of—		Related data		
	All employee	All employee man-hour	All employees	All employee man-hours	Output	All employees	All employee man-hours
1958 -----	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1959 -----	103.6	101.6	96.5	98.4	113.9	109.9	112.1
1960 -----	101.0	101.2	99.0	98.9	114.0	112.9	112.7
1961 -----	108.2	106.8	92.4	93.6	121.8	112.6	114.0
1962 -----	110.6	108.4	90.4	92.2	130.1	117.6	120.0
1963 -----	117.3	115.6	85.3	86.5	137.9	117.6	119.3
1964 -----	121.1	116.8	82.5	85.6	147.8	122.0	126.5
1965 -----	124.6	119.7	80.3	83.6	159.3	127.9	133.1
1966 -----	127.0	123.5	78.8	81.0	172.3	135.7	139.5

Source: Output based on data from the Fibre Box Association and the Bureau of the Census, U.S. Department of Commerce. Employment and man-hours based on data from the Bureau of Labor Statistics, U.S. Department of Labor and the Bureau of the Census.

**CHART 1. CORRUGATED AND SOLID FIBER BOXES INDUSTRY:  
INDEXES OF OUTPUT PER ALL EMPLOYEE MAN-HOUR, OUTPUT, AND  
ALL EMPLOYEE MAN-HOURS, 1958-66**

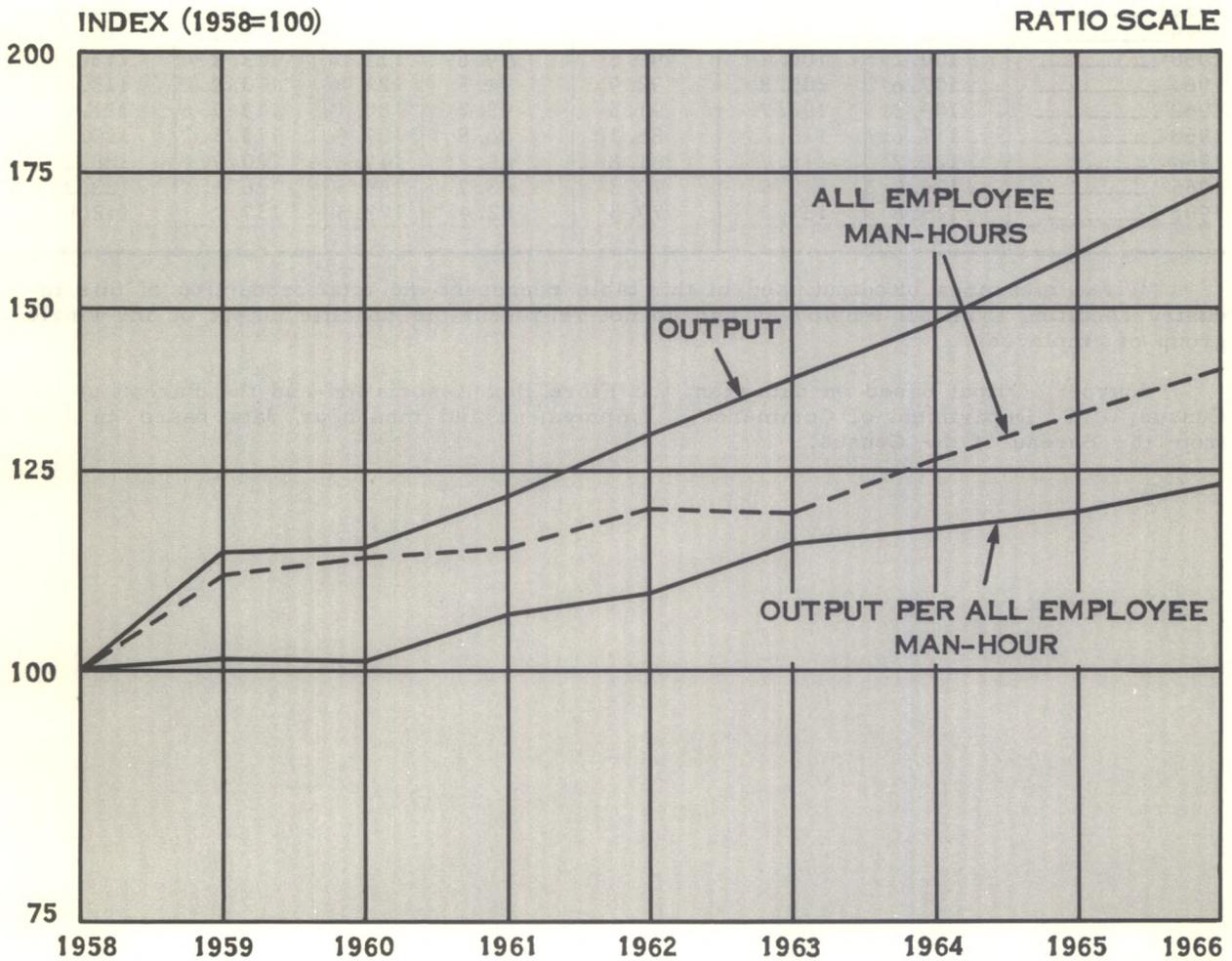


Table 3. Corrugated and Solid Fiber Boxes Industry: Output Per Man-Hour, Unit Labor Requirements, and Related Data, Production Workers, 1958-66

Indexes (1958 = 100)

Year	Output per—		Unit labor require- ments in terms of—		Related data		
	Production worker	Production worker man-hour	Production workers	Production worker man-hours	Output <sup>1</sup>	Production workers	Production worker man-hours
1958 -----	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1959 -----	102.3	99.8	97.7	100.2	113.9	111.3	114.1
1960 -----	100.2	100.4	99.8	99.6	114.0	113.8	113.6
1961 -----	107.6	105.8	92.9	94.5	121.8	113.2	115.1
1962 -----	109.3	106.7	91.5	93.7	130.1	119.0	121.9
1963 -----	117.6	115.2	85.1	86.8	137.9	117.3	119.7
1964 -----	122.2	116.7	81.8	85.7	147.8	120.9	126.7
1965 -----	126.0	119.5	79.3	83.7	159.3	126.4	133.3
1966 -----	125.8	121.3	79.5	82.4	172.3	137.0	142.0

<sup>1</sup> The measures of output used in this table represent the total production of this industry resulting from all employees and do not represent the specific output of any single group of employees.

Source: Output based on data from the Fibre Box Association and the Bureau of the Census, U.S. Department of Commerce. Employment and man-hour data based on data from the Bureau of the Census.

**CHART 2. CORRUGATED AND SOLID FIBER BOXES INDUSTRY:  
INDEXES OF OUTPUT PER PRODUCTION WORKER MAN-HOUR, OUTPUT,  
AND PRODUCTION WORKER MAN-HOURS, 1958-66**

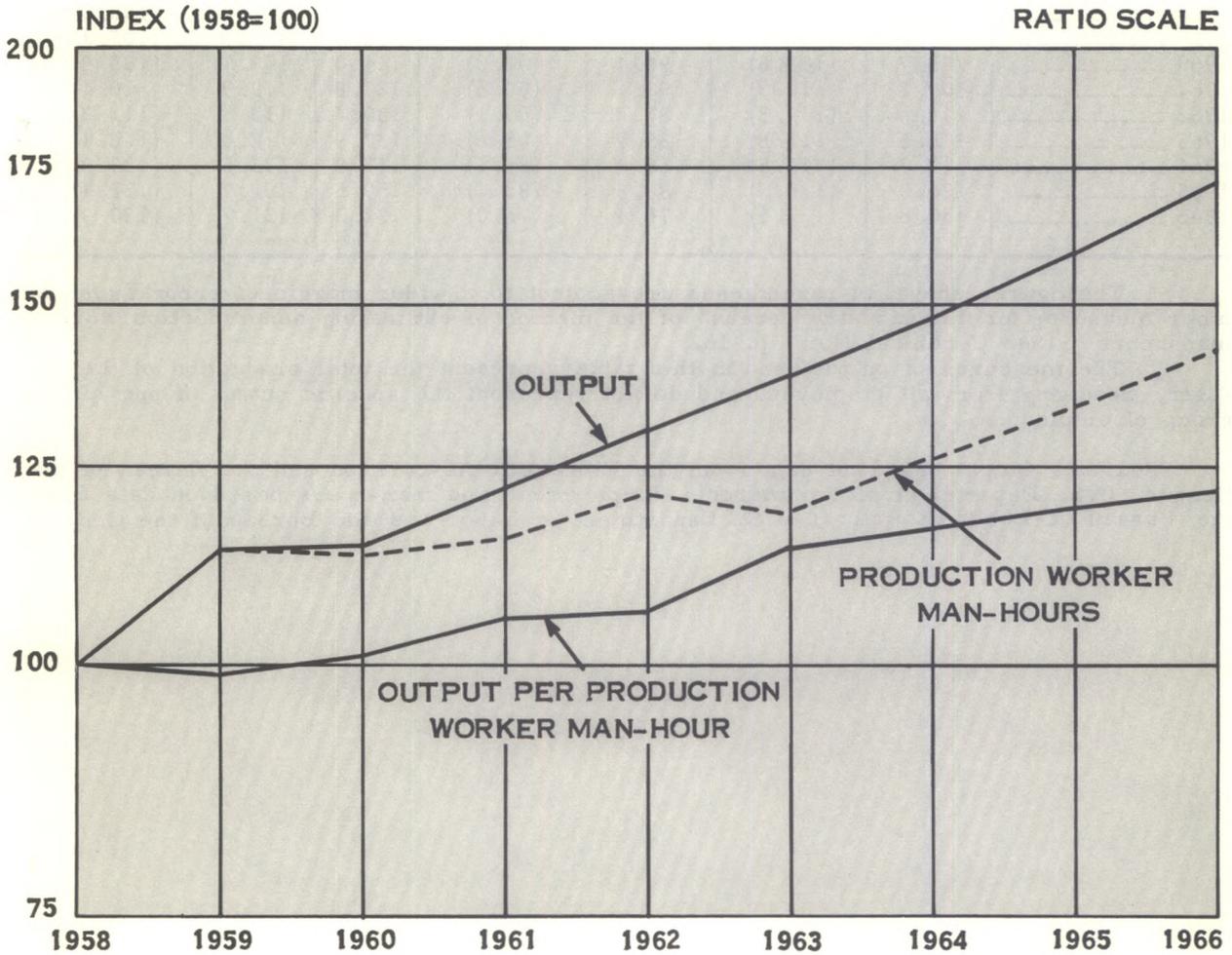


Table 4. Corrugated and Solid Fiber Boxes Industry: Output Per Man-Hour, Unit Labor Requirements, and Related Data, Nonproduction Workers, 1958-66

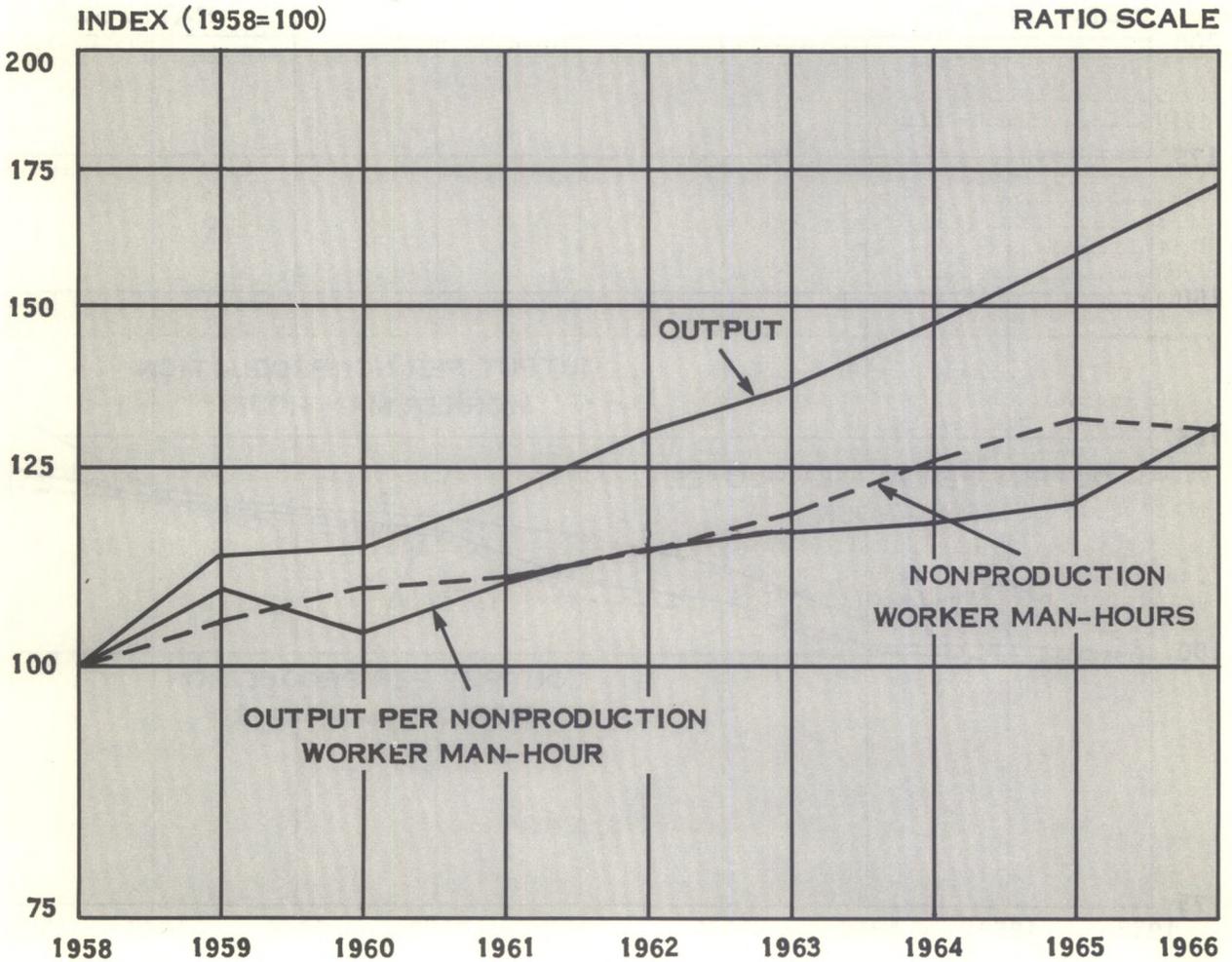
Indexes (1958 = 100)							
Year	Output per—		Unit labor require- ments in terms of—		Related data		
	Nonpro- duction worker	Nonpro- duction worker man-hour <sup>1</sup>	Nonpro- duction workers	Nonpro- duction worker man-hours <sup>1</sup>	Output <sup>2</sup>	Nonpro- duction workers	Nonpro- duction worker man-hours <sup>1</sup>
1958 -----	100.0	(100.0)	100.0	(100.0)	100.0	100.0	(100.0)
1959 -----	108.3	(108.4)	92.4	(92.3)	113.9	105.2	(105.1)
1960 -----	103.7	(103.8)	96.4	(96.3)	114.0	109.9	(109.8)
1961 -----	109.8	(110.3)	91.1	(90.6)	121.8	110.9	(110.4)
1962 -----	114.6	(114.8)	87.2	(87.1)	130.1	113.5	(113.3)
1963 -----	116.5	(116.8)	85.9	(85.6)	137.9	118.4	(118.1)
1964 -----	117.7	(117.5)	85.0	(85.1)	147.8	125.6	(125.8)
1965 -----	120.0	(120.3)	83.3	(83.1)	159.3	132.7	(132.4)
1966 -----	130.8	(131.6)	76.4	(76.0)	172.3	131.7	(130.9)

<sup>1</sup> The figures shown in parentheses are subject to a wider margin of error than are other measures for this industry because of the method of estimating nonproduction worker man-hours. (See Technical Note, p. 16.)

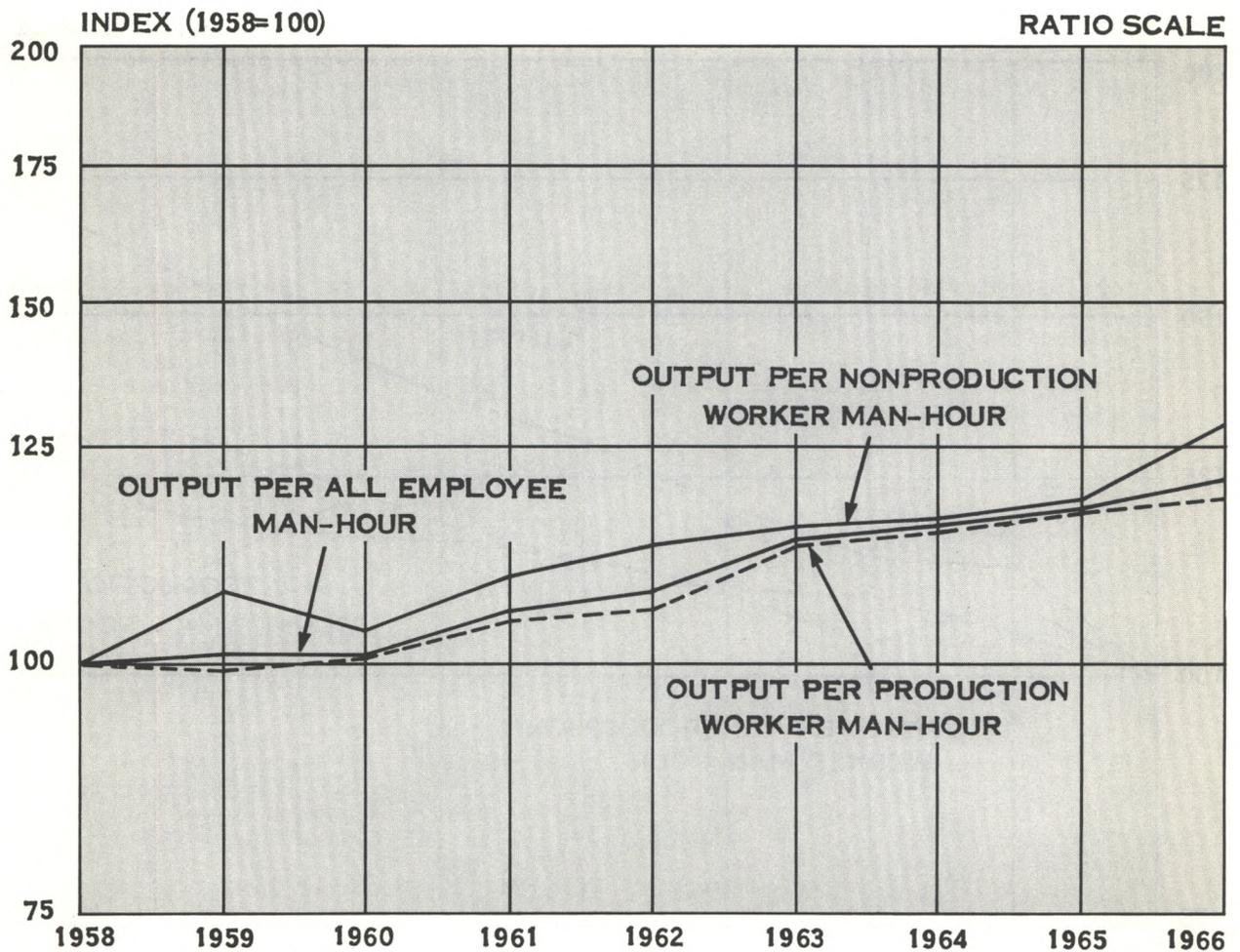
<sup>2</sup> The measures of output used in this table represent the total production of the industry resulting from all employees and do not represent the specific output of any single group of employees.

Source: Output based on data from the Fibre Box Association and the Bureau of the Census, U.S. Department of Commerce. Employment and man-hours based on data from the Bureau of Labor Statistics, U.S. Department of Labor and the Bureau of the Census.

**CHART 3. CORRUGATED AND SOLID FIBER BOXES INDUSTRY:  
INDEXES OF OUTPUT PER NONPRODUCTION WORKER MAN-HOUR, OUTPUT, AND  
NONPRODUCTION WORKER MAN-HOURS, 1958-66**



**CHART 4. CORRUGATED AND SOLID FIBER BOXES INDUSTRY:  
INDEXES OF OUTPUT PER MAN-HOUR, ALL EMPLOYEES, PRODUCTION  
WORKERS, AND NONPRODUCTION WORKERS, 1958-66**



## Technical Note

### Output Per Man-Hour Indexes<sup>4</sup>

The indexes of output per man-hour presented in this report have been developed according to procedures followed by the Bureau of Labor Statistics for measuring change in the relationship between industry output and the man-hours expended on that output.

For an industry producing a single uniform product or performing a single service, the indexes simply measure the change over time in the ratio: Units produced to man-hours. For an industry producing a number of products, the indexes represent the change over time in the ratio: Weighted output (of a specified composite of products) to man-hours. An index of output per man-hour for each year is obtained by dividing the output index by the man-hour index.

### Output Index

For constructing indexes of output per man-hour, the ideal output index weights (multiplies) the quantities of all products produced in the industry by the man-hours required to make one unit of each product in a specified year. Thus, those products which require more labor time are given more importance. Although unit man-hour weights are preferable for combining product data, they are frequently not available. Therefore, substitute weights believed to be proportional to unit man-hour weights are often necessary—usually unit value weights. The output indexes for the corrugated and solid fiber boxes industry were constructed with unit value weights.

The output indexes are derived from comprehensive data collected by the Census of Manufactures for 1958 and 1963 and annual data published by the Fibre Box Association (FBA). Indexes were computed for 1958 and 1963 from the census data (1958 = 100) and are referred to as benchmark indexes. Annual indexes for intercensal years were based on less detailed information published by the trade association and were adjusted to the level of the benchmark indexes. The 1958-63 benchmark index was constructed in the following manner:

1. A physical quantity of shipments index was computed for the industry's primary products. This index was derived by combining the quantities with 1958 unit value weights. Table 5 shows the list of primary products and 1958 unit value weights. The index reflects shipments of corrugated and fiber box products by the industry, and also those shipped as secondary products by other industries. The latter accounted for about 5 percent of total shipments of these products.
2. The index of primary products is adjusted by a "coverage" ratio to represent total output of the industry. The coverage adjustment is the ratio of the index of the value of industry production (value of shipments after exclusion of re-sales and inclusion of net additions to inventories) to the index of the value of shipments of primary products. The final industry output index thus reflects inventory buildups and changing proportions of secondary products, as well as the primary products shipped by the industry.

This procedure assumes that the price movements between census years for the products primary to the industry (including those shipped by other industries) were the same as price movements for the industry's total shipments. Since primary products accounted for 97 percent of total shipments in 1963 and 1958 and the industry accounted for 95 percent of the primary products, little difference can occur in the price movements.

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<sup>4</sup> For a more detailed description of the general concepts and procedures, see ch. 23, "Output Per Man-Hour Measures: Industries," BLS Handbook of Methods for Surveys and Studies (BLS Bulletin 1458, 1966).

Table 5. Corrugated and Solid Fiber Boxes Industry: Unit Value Weights  
Used in Compiling Output Indexes, and Relative Importance  
of Product Groups, 1958 and 1963

Product group	Unit value weights		Relative importance	
	1958	1963	1958	1963
Benchmark index:	(Dollars per short ton)		(Percent)	
Corrugated shipping containers -----	224.51	214.92	90.53	93.73
Solid fiber boxes -----	240.74	262.77	2.68	1.18
Corrugated paperboard in sheets and rolls, lined and unlined -----	196.26	169.70	3.59	2.00
Corrugated and solid fiber pallets, pads and partitions -----	240.39	221.73	1.06	1.27
Corrugated and solid fiber boxes, (not specified by kind) -----	225.25	265.00	<u>2.15</u>	<u>1.82</u>
Total -----			100.00	100.00
Annual index:	(Dollars per thousand square feet)			
Corrugated shipping containers -----	15.99	15.89		
Solid fiber boxes -----	34.21	35.94		

Source: Benchmark weights derived from the Census of Manufactures: 1963, Bureau of the Census, U.S. Department of Commerce. Annual weights derived from data published in Fibre Box Industry Statistics, 1958 and 1963, Fibre Box Association.

The indexes for intercensal years are based on data published by the FBA in the Fibre Box Industry Statistics, their annual publication. FBA data also were used to compute the unit value weights needed to combine annual product output because quantity units reported in the Census of Manufactures differ from those reported by the FBA. The Census of Manufactures reports output in tons while the FBA reports production in thousands of square feet. Table 5 shows the product breakdown reported by the FBA and the corresponding unit value weights for 1958 and 1963.

The annual output indexes were derived by the following procedures:

1. The quantity of each product produced for the years 1958 through 1963 was multiplied by the appropriate 1958 unit value weight.
2. The resulting weighted aggregates, summed for each year, were divided by the 1958 weighted aggregate to obtain annual output indexes (1958 = 100).
3. The annual indexes then were adjusted to the 1958-63 benchmark indexes developed from Census of Manufactures data. The cumulative adjustment between 1958 and 1963 was about 4 percent.
4. The 1963-66 indexes are based on 1963 unit value weights, linked to the 1958 weighted indexes in 1963.

#### Employment and Man-Hours Indexes

Employment and man-hour indexes measure change in these elements over a period of time. Employees and employee man-hours are treated as homogeneous and additive. Thus, the indexes do not reflect changes in qualitative aspects of employment such as skill, efficiency, health, experience, age, and sex of persons constituting the aggregate. The man-hour data relate to total time expended by employees in establishments classified in the industry. These data include hours spent not only on production of primary products, but also on secondary products and miscellaneous production.

Six labor input indexes have been developed for the corrugated box industry: All employees, production workers, nonproduction workers, all employee man-hours, production worker man-hours, and nonproduction worker man-hours.

"Production workers" cover working foremen and all nonsupervisory workers (including leadmen and trainees) engaged in fabricating, processing, assembling, inspection, receiving, storage, handling, packing, warehousing, shipping, maintenance, repair, janitorial and watchman services, product development, auxiliary production for plant's own use (e.g., powerplant operations), recordkeeping, and other services closely associated with production activities. The term thus includes some indirect as well as direct plant labor.

"Nonproduction workers" include employees engaged in the following activities: Executive, purchasing, finance, accounting, legal, personnel, cafeteria, medical, professional and technical activities, sales, advertising, credit, collection, installation and servicing of own products, routine office functions, factory supervision (above the working foreman level), and force-account construction employees on the payroll engaged in construction of major additions or alterations to the plant who are utilized as a separate work force.

"All employees" represent the sum of production workers and nonproduction workers.

Employment and Production Worker Man-Hours. The indexes of total employment, production workers, production worker man-hours, and nonproduction workers were based on data published by the Bureau of the Census. Data for 1958 and 1963 were obtained from the

Census of Manufactures and data for the remaining years from the Annual Survey of Manufactures.<sup>5</sup> Production worker man-hours include all the hours at the plant, worked or paid for, and exclude paid time for vacations, holidays, or sick leave. Overtime and other premium pay hours are included on the basis of actual time at the plant.

All Employee Man-Hours. The index of all employee man-hours for this industry is derived from three components: (1) Production worker man-hours (from census data); (2) number of nonproduction workers (from census data); and (3) an estimate of average annual hours at work for nonproduction workers (prepared by the Bureau of Labor Statistics for this report and derived primarily from Department of Labor studies).

Average annual hours for nonproduction workers were derived by multiplying estimated scheduled weekly hours by the number of weeks in the year. Time away from the job, as represented by various types of leave, was subtracted from total annual hours to obtain annual hours at work.

Scheduled weekly hours for nonproduction workers were estimated from unpublished data collected in BLS surveys of employer expenditures for selected supplementary remunerative practices. These scheduled hours were available for SIC Group 26, paper and allied products, of which the corrugated and solid fiber boxes industry is a part.

The average annual hours worked by nonproduction workers in this industry for selected years were estimated as follows:

	Average annual hours
1958 -----	1,876
1960 -----	1,873
1963 -----	1,872

These estimates were multiplied by the number of nonproduction workers to obtain the man-hour indexes for nonproduction workers shown on table 4. Since employment trends for nonproduction workers largely determine their man-hour trends, any reasonable alternative estimates of paid time off would result in only minor differences in the nonproduction worker man-hour indexes and in no significant changes in the all employee man-hour indexes.

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<sup>5</sup> Employees in central administrative offices and auxiliaries of corrugated box companies are not included.

**Appendix. Corrugated and Solid Fiber Boxes Industry:  
Average Annual Rates of Change (Percent)<sup>1</sup>**

(To obtain annual rates of change between any 2 years shown, find row for initial year at left of table and read figure in that row under the terminal year shown on top)

Initial year	Terminal year							
	1959	1960	1961	1962	1963	1964	1965	1966
	Output per all employee man-hour							
1958 -----	1.6	0.6	2.0	2.1	2.8	2.9	2.9	2.9
1959 -----	-	-.4	2.5	2.5	3.3	3.2	3.1	3.1
1960 -----	-	-	5.6	3.5	4.2	3.7	3.4	3.3
1961 -----	-	-	-	1.5	4.0	3.4	3.1	3.0
1962 -----	-	-	-	-	6.6	3.8	3.1	3.0
1963 -----	-	-	-	-	-	1.1	1.8	2.3
1964 -----	-	-	-	-	-	-	2.4	2.8
1965 -----	-	-	-	-	-	-	-	3.2
	Output							
1958 -----	13.9	6.8	6.1	6.1	6.1	6.2	6.4	6.6
1959 -----	-	.1	3.4	4.8	5.3	5.7	6.1	6.4
1960 -----	-	-	6.8	6.8	6.6	6.6	6.8	7.0
1961 -----	-	-	-	6.8	6.4	6.6	6.9	7.1
1962 -----	-	-	-	-	6.0	6.6	7.0	7.3
1963 -----	-	-	-	-	-	7.2	7.5	7.7
1964 -----	-	-	-	-	-	-	7.8	8.0
1965 -----	-	-	-	-	-	-	-	8.2
	All employee man-hours							
1958 -----	12.1	6.2	4.1	3.9	3.2	3.2	3.4	3.6
1959 -----	-	.5	.8	2.2	1.9	2.4	2.9	3.2
1960 -----	-	-	1.2	3.2	2.2	2.8	3.3	3.6
1961 -----	-	-	-	5.3	2.3	3.1	3.7	4.0
1962 -----	-	-	-	-	-.6	2.7	3.8	4.2
1963 -----	-	-	-	-	-	6.0	5.6	5.3
1964 -----	-	-	-	-	-	-	5.2	5.0
1965 -----	-	-	-	-	-	-	-	4.8

See footnote at end of table.

(To obtain annual rates of change between any 2 years shown, find row for initial year at left of table and read figure in that row under the terminal year shown on top)

Initial year	Terminal year							
	1959	1960	1961	1962	1963	1964	1965	1966
Output per all employee								
1958 -----	3.6	0.5	2.1	2.5	3.1	3.3	3.4	3.3
1959 -----	-	-2.6	2.2	2.7	3.4	3.6	3.6	3.5
1960 -----	-	-	7.1	4.7	4.8	4.6	4.2	3.9
1961 -----	-	-	-	2.3	4.1	4.1	3.8	3.5
1962 -----	-	-	-	-	6.0	4.6	4.0	3.4
1963 -----	-	-	-	-	-	3.3	3.1	2.7
1964 -----	-	-	-	-	-	-	2.8	2.4
1965 -----	-	-	-	-	-	-	-	1.9
Output per production worker man-hour								
1958 -----	-0.2	0.2	1.8	1.9	2.8	2.9	3.0	2.9
1959 -----	-	.5	3.0	2.6	3.5	3.5	3.4	3.2
1960 -----	-	-	5.4	3.1	4.3	3.9	3.6	3.3
1961 -----	-	-	-	.9	4.3	3.8	3.4	3.0
1962 -----	-	-	-	-	7.9	4.5	3.6	3.0
1963 -----	-	-	-	-	-	1.3	1.8	1.8
1964 -----	-	-	-	-	-	-	2.4	2.0
1965 -----	-	-	-	-	-	-	-	1.5
Production worker man-hours								
1958 -----	14.1	6.6	4.3	4.1	3.2	3.2	3.3	3.6
1959 -----	-	-.4	.4	2.1	1.7	2.1	2.6	3.1
1960 -----	-	-	1.3	3.6	2.2	2.6	3.1	3.6
1961 -----	-	-	-	5.9	2.0	2.7	3.4	4.0
1962 -----	-	-	-	-	-1.8	1.9	3.3	4.2
1963 -----	-	-	-	-	-	5.8	5.5	5.8
1964 -----	-	-	-	-	-	-	5.2	5.9
1965 -----	-	-	-	-	-	-	-	6.5

(To obtain annual rates of change between any 2 years shown, find row for initial year at left of table and read figure in that row under the terminal year shown on top)

Initial year	Terminal year							
	1959	1960	1961	1962	1963	1964	1965	1966
Output per production worker								
1958 -----	2.3	0.1	2.0	2.3	3.1	3.5	3.6	3.4
1959 -----	-	-2.1	2.5	2.7	3.7	4.0	4.0	3.7
1960 -----	-	-	7.4	4.5	5.1	5.0	4.7	4.0
1961 -----	-	-	-	1.6	4.5	4.7	4.4	3.6
1962 -----	-	-	-	-	7.5	5.7	4.8	3.6
1963 -----	-	-	-	-	-	4.0	3.5	2.4
1964 -----	-	-	-	-	-	-	3.1	1.4
1965 -----	-	-	-	-	-	-	-	-2
Nonproduction worker man-hours								
1958 -----	5.1	4.8	3.5	3.0	3.1	3.5	3.8	3.6
1959 -----	-	4.5	2.5	2.3	2.7	3.3	3.8	3.5
1960 -----	-	-	.5	1.6	2.5	3.5	4.0	3.6
1961 -----	-	-	-	2.6	3.4	4.4	4.8	4.0
1962 -----	-	-	-	-	4.2	5.4	5.4	4.1
1963 -----	-	-	-	-	-	6.5	5.9	3.7
1964 -----	-	-	-	-	-	-	5.2	2.0
1965 -----	-	-	-	-	-	-	-	-1.1
Output per nonproduction worker man-hour								
1958 -----	8.4	1.9	2.6	3.0	2.9	2.7	2.5	2.9
1959 -----	-	-4.2	.9	2.4	2.5	2.3	2.2	2.8
1960 -----	-	-	6.3	5.2	4.0	3.1	2.7	3.3
1961 -----	-	-	-	4.1	2.9	2.1	2.0	3.0
1962 -----	-	-	-	-	1.7	1.2	1.5	3.1
1963 -----	-	-	-	-	-	.6	1.5	3.9
1964 -----	-	-	-	-	-	-	2.4	5.8
1965 -----	-	-	-	-	-	-	-	9.4

<sup>1</sup> Average annual rates are based on the linear least squares trend line fitted to the logarithms of the index numbers.



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