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INDEXES OF OUTPUT PER PERSON EMPLOYED AND PER MAN-HOUR IN CANADA COMMERCIAL INDUSTRIES

1946-65

DOMINION BUREAU OF STATISTICS

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Industry Division
Productivity Research and Analysis Section

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1946 - 65

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FOREWORD

The present report is the first annual publication on aggregate productivity after the release of the Reference Paper, "Indexes of Output per Person Employed and per Man-Hour in Canada, Commercial Nonagricultural Industries, 1947-63" (Catalogue No. 14-501), in April 1965.

Since the publication of this Reference Paper, data for agriculture have been added to the measures which thus now cover the entire commercial sector of the economy. Figures in this report are not only updated to 1965 and revised where necessary but are also extended back to 1946.

For a general account of the conceptual and statistical basis of the indexes presented in this report, users are referred to Part III, "Concepts and Methods", of the above mentioned Reference Paper.

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PART I

SUMMARY OF FINDINGS

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Overall Changes in Output per Unit of Labour Input, 1946-65

During the postwar period, from 1946 to 1965, output per person employed in the commercial non-agricultural industries increased by 56.3%, or at the rate of 2.5% per annum. Because of the decline in average hours worked per person, this is a lower rate of growth than that of output per man-hour which, during the same period, increased at an annual rate of 3.2%, and in 1965 was 76.5% higher than in 1946.

In manufacturing, between 1946 and 1965, output per person employed increased by 86.6%, while output per man-hour was 102.2% higher in 1965 than in the first postwar year. The corresponding average annual growth rates were 3.4% and 3.8% respectively.

In the other commercial nonagricultural industries, output per person employed increased by 42.7% during the postwar period, or on the average by 2.1% annually, while output per man-hour grew by 65.4%, representing an annual growth rate of 2.9%.

For the first time, measures of output per unit of labour input have been calculated for agriculture as well. For these estimates, employment data were taken directly from the monthly Labour Force Survey, while the calculation of man-hour data followed the procedure that was used for the other industries. It should be mentioned, however, that labour input data, especially the number of man-hours worked, cannot be measured in agriculture as precisely as in the nonagricultural industries. As far as output in agriculture is concerned, it has not so far been possible to embody into the Bureau's published measures the more current benchmark data on gross outputs which will provide a basis for correction of any bias which may have resulted over the previous decade through the use of less comprehensive annual, quarterly and monthly data. Furthermore, for the years 1958 to 1965, it was necessary to project the conceptually preferable index of net output by means of the (uncorrected) gross output measure, a situation which will persist until a number of sources of intermediate input data can be fully exploited.

In view of these difficulties, the productivity measures shown for agriculture in the present report should be regarded as approximate in nature. The primary purpose of drawing on the data for agriculture was to extend the coverage of the aggregate index rather than to focus attention upon agriculture as such. However, the tentative data do indicate that, between 1946 and 1965, output per person employed in agriculture increased by 176.5%, while output per man-hour was 199.1% higher in 1965 than in 1946. Average annual growth rates for the same period were 5.3% and 5.5% respectively.

For the commercial sector as a whole, embracing manufacturing, agriculture and the other non-manufacturing industries of the commercial sector, output per person employed increased by 82.7% in the postwar period, or at an annual rate of 3.3%. Corresponding figures for output per man-hour were 113.9% and 4.1% respectively.

Revision of Figures Published Previously

Since the publication of the Reference Paper on productivity, the first of a number of major revisions planned for the output measures has been completed which also affects the productivity indexes. This particular revision is concerned only with the Index of Industrial Production component of the more comprehensive Real Domestic Product aggregate for the post-1948 period and, as regards annual data, reflects the incorporation of more recent benchmarks (census-based annual levels), the substitution of a few improved monthly projectors, the incorporation of revisions to the underlying data and the use of improved method of adjusting monthly series to annual levels.[1]

Certain minor refinements have also been made to the labour input component of the productivity ratios. The most noteworthy change was in the method of estimating the paid worker indexes after 1961 for the construction industry component of the aggregate measures. While, for 1946 to 1961, the average of the adjusted Employment Survey and Labour Force Survey indexes was used, this was replaced, beginning with 1962, by the indexes published in the "Estimates of Employees by Province and Industry".[2]

Comparison with United States Data

Charts 13 to 18 show, together with the corresponding Canadian data, indexes of output per person employed and per man-hour in the private economy of the United States and its agricultural and nonagricultural components for the period 1947 to 1965. Since the real output data for manufacturing in the United States are now being revised by the U.S. Department of Commerce and separate detail for manufacturing and nonmanufacturing is not available in the official U.S. productivity publications, no data are shown in the present report for these sectors of the United States economy.

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[1] For a more detailed account of this project, see the "Annual Supplement to the Monthly Index of Industrial Production", May 1966, DBS Catalogue No. 61-005 (Supplement). Some additional revisions have been incorporated in the measures since the publication of the July 1966 issue of the "Index of Industrial Production", DBS Catalogue No. 61-005.

[2] DBS Catalogue No. 72-008.

The inclusion of figures for 1964 and 1965 has had no noticeable effect on the general conclusion arrived at in the Reference Paper,[3] namely that the overall movements of productivity in the commercial nonagricultural industries of Canada and the United States[4] were quite similar during the postwar period as a whole.

In agriculture, year-to-year changes of output per unit of labour input over the period 1947 to 1965 were markedly different between Canada and the United States, with the much greater variability of the Canadian measures being explained, for the most part, by fluctuations arising out of wide variations in the production of grain in Western Canada. Nevertheless, overall gains in agricultural productivity in the two countries during this period were very similar and, as a consequence, the previously noted similarities in the productivity performance of the commercial nonagricultural industries generally hold good for the entire commercial (private) sector also.

Effects of Interindustry Shifts

What may be referred to as the "basic" productivity index, and which is shown throughout the tables and charts of this report, is derived by dividing an index representing a simple aggregate of labour inputs into an index of real output derived by projecting the base year distribution of Gross Domestic Product by means of individual indicators for the component industries. As such, the index reflects the influence of shifts between products, plants and industries which are, of course, an important contributing factor to aggregate productivity change.

The faster expansion of the nonagricultural industries during the postwar period than that of agriculture has contributed importantly to the overall increase of productivity in the commercial industries as a whole, due to the higher level of output per unit of labour input in the nonagricultural sector. The change in the relative importance of these two main components of the commercial industries in Canada is shown in the following table:

Sector	Distribution of					
	Output		Persons employed		Man-hours	
	1946	1965	1946	1965	1946	1965
Commercial industries	100.0	100.0	100.0	100.0	100.0	100.0
Agriculture	14.5	8.2	29.0	10.9	33.6	13.7
Nonagricultural industries	85.5	91.8	71.0	89.1	66.4	86.3

The effects of the interindustry shifts on aggregate productivity change may be eliminated by keeping constant either the output or the input proportions of the various sectors when calculating the productivity indexes. The question as to which of these indexes is the most meaningful is essentially arbitrary, as also is the choice of years from which to calculate the proportions. Accordingly, four alternative "shift-free" measures have been calculated, using both 1946 and 1965 proportions of outputs and inputs respectively so as to indicate the range of possible variation.

These indexes are shown in the following table, together with the formulae used in their calculation. The formulae, described in detail in various publications,[5] are presented here only in their simplified final form. Output is denoted by q, labour input by l, while the years 1946 and 1965 are represented by the subscripts o and i respectively.

[3] See page 11 of the productivity Reference Paper (DBS Catalogue No. 14-501).

[4] United States data cover the private industries.

[5] See references given on page 34 of the productivity Reference Paper (DBS Catalogue No. 14-501).

Productivity Indexes for the Commercial Industries Excluding the Effects of Shifts between Agriculture and Nonagriculture, Canada, 1946 - 65

No. of index	Interpretation of the index		Output per person employed	Output per man-hour	Formula used
1.	Basic productivity index (includes the effects of shifts)		182.7	213.9	$\frac{\Sigma q_i \Sigma l_o}{\Sigma q_o \Sigma l_i}$
2.	Productivity indexes excluding the effects of shifts	With 1946 labour input proportions	173.7	194.3	$\frac{\sum \frac{q_i \; l_o}{l_i}}{\Sigma q_o}$
3.		With 1965 labour input proportions	162.1	182.6	$\frac{\Sigma q_i}{\sum \frac{q_o \; l_i}{l_o}}$
4.		With 1946 output proportions	178.8	204.7	$\frac{\Sigma l_o}{\sum \frac{q_o \; l_i}{q_i}}$
5.		With 1965 output proportions	169.4	193.2	$\frac{\sum \frac{q_i \; l_o}{q_o}}{\Sigma l_i}$

As may be seen from the preceding table, all "shift-free" indexes (No. 2-5) are lower than the corresponding "basic" productivity index, the magnitude of which has been increased by the shifts between agriculture and nonagriculture which have taken place within the total commercial sector of the economy.

While the "shift-free" indexes in the preceding table present the combined contribution of the productivity gain achieved *within* agriculture and the nonagricultural industries, the effect of the shifts can also be singled out directly, by an extension of the methodology used above.

Productivity Indexes for the Commercial Industries Showing Only the Effects of Shifts between Agriculture and Nonagriculture, Canada, 1946-65

No. of index	Interpretation of the index	Output per person employed	Output per man-hour	Formula used
6.	With 1946 productivity and actual labour input proportions	112.7	117.1	$\frac{\Sigma l_o \sum \frac{q_o \; l_i}{l_o}}{\Sigma l_i \; \Sigma q_o}$
7.	With 1965 productivity and actual labour input proportions	105.2	110.1	$\frac{\Sigma q_i \; \Sigma l_o}{\Sigma l_i \sum \frac{q_i \; l_o}{l_i}}$
8.	With 1946 productivity and actual output proportions	107.9	110.7	$\frac{\Sigma q_i \; \Sigma l_o}{\Sigma q_o \sum \frac{q_i \; l_o}{q_o}}$
9.	With 1965 productivity and actual output proportions	102.2	104.5	$\frac{\Sigma q_i \sum \frac{q_o \; l_i}{q_i}}{\Sigma l_i \; \Sigma q_o}$

The indexes of the two tables are, of course, complementary in nature. By selecting the appropriate indexes, one from each of the two tables presented previously, their product, after dividing by 100, is equal to the basic productivity index, i.e. a "shift-free" index multiplied by an index showing the effect of the shift, yields an index which reflects the joint effect of both types of influence:

$$\frac{\text{Index No. 3} \times \text{Index No. 6}}{100} = \text{Index No. 1}$$

$$\frac{\text{Index No. 2} \times \text{Index No. 7}}{100} = \text{Index No. 1}$$

$$\frac{\text{Index No. 5} \times \text{Index No. 8}}{100} = \text{Index No. 1}$$

$$\frac{\text{Index No. 4} \times \text{Index No. 9}}{100} = \text{Index No. 1}$$

This shows that a productivity index for an aggregate expresses the combined result of two basic types of development: change of productivity in the component industries and shifts between these components.

The effects of shifts between agriculture and nonagriculture were most marked during the earlier part of the postwar period. This is partly due to the fact that the gap between the level of productivity in the two sectors became progressively smaller during the period in question. While, in 1946, the level of output per person employed in agriculture was only 41.6% of that in nonagriculture, this ratio stood at 73.6% in 1965. Corresponding figures for output per man-hour are 33.5% and 56.8% respectively. The other reason for the decreasing effects of shifts on productivity is that the shift itself has been proceeding more slowly since the latter part of the 1950's.

Calculations have also been made to estimate the effects of shifts between manufacturing and the nonmanufacturing industries within the commercial nonagricultural sector. The results of these calculations, however, indicate that the effects of these shifts on productivity, between 1946 and 1965, are of negligible magnitude. Possible shift-effects within manufacturing and within the nonmanufacturing industries have not yet been analysed.

PART II

TABLES AND CHARTS

TABLE 1. Indexes of Output per Person Employed and per Man-hour, and of Unit Man-year and Unit Man-hour Requirements, Commercial Nonagricultural Industries, Canada, 1946-65

(1949 = 100)

Year	Indexes of									
	Output	Persons employed	Man-hours	Output per person employed		Output per man-hour		Unit man-year requirements		Unit man-hour requirements	
				Original data	Trend values[1]	Original data	Trend values[1]	Original data	Trend values[1]	Original data	Trend values[1]
1946	85.3	86.9	88.6	98.1	94.7	96.2	93.7	101.9	105.6	103.9	106.7
1947	92.8	94.6	95.3	98.1	97.1	97.3	96.7	101.9	103.0	102.7	103.4
1948	96.3	97.8	98.6	98.5	99.5	97.7	99.8	101.5	100.5	102.4	100.2
1949	100.0	100.0	100.0	100.0	102.1	100.0	103.0	100.0	98.0	100.0	97.1
1950	106.7	102.0	100.1	104.6	104.6	106.7	106.3	95.6	95.6	93.8	94.1
1951	114.1	107.7	104.8	106.0	107.3	108.9	109.7	94.3	93.2	91.8	91.2
1952	119.5	110.4	106.6	108.3	110.0	112.2	113.2	92.3	90.9	89.1	88.3
1953	125.8	112.1	107.5	112.2	112.8	116.9	116.8	89.1	88.6	85.5	85.6
1954	126.0	110.6	104.9	113.9	115.7	120.1	120.5	87.8	86.5	83.3	83.0
1955	137.5	114.1	107.9	120.5	118.6	127.4	124.4	83.0	84.3	78.5	80.4
1956	150.9	121.0	115.0	124.7	121.6	131.2	128.4	80.2	82.2	76.2	77.9
1957	153.5	124.5	116.4	123.3	124.7	131.9	132.5	81.1	80.2	75.8	75.5
1958	154.2	121.3	112.3	127.1	127.9	137.2	136.7	78.7	78.2	72.9	73.2
1959	163.9	124.3	115.5	131.8	131.1	141.9	141.1	75.9	76.3	70.5	70.9
1960	166.1	124.2	114.6	133.8	134.4	145.0	145.6	74.7	74.4	69.0	68.7
1961	170.8	124.7	113.4	137.0	137.8	150.7	150.2	73.0	72.6	66.4	66.6
1962	181.0	128.4	117.4	141.0	141.3	154.1	155.0	70.9	70.8	64.9	64.5
1963	191.2	131.5	119.8	145.4	144.9	159.6	159.9	68.8	69.0	62.6	62.5
1964	205.8	137.4	125.4	149.8	148.6	164.2	165.1	66.8	87.3	60.9	60.6
1965	221.0	144.2	130.1	153.3	152.4	169.8	170.3	65.2	65.6	58.9	58.7
1965 as % of 1946	259.3	165.9	146.9	156.3	160.9	176.5	161.7	64.0	62.1	56.7	55.0
Annual trend rate of change (%)	+ 4.8	+ 2.2	+ 1.5	+ 2.5		+ 3.2		– 2.5		– 3.1	

[1] Calculated by fitting a straight line to the logarithms of the data using the least squares method.

TABLE 2. Indexes of Output per Person Employed and per Man-hour, and of Unit Man-year and Unit Man-hour Requirements, Manufacturing, Canada, 1946-65

(1949 = 100)

Year	Indexes of									
	Output	Persons employed	Man-hours	Output per person employed		Output per man-hour		Unit man-year requirements		Unit man-hour requirements	
				Original data	Trend values[1]	Original data	Trend values[1]	Original data	Trend values[1]	Original data	Trend values[1]
1946	85.2	90.0	92.3	94.7	91.3	92.3	90.6	105.6	109.6	108.3	110.1
1947	93.2	96.3	97.7	96.9	94.4	95.5	94.3	103.2	105.9	104.7	106.0
1948	97.3	98.5	100.4	98.7	97.6	96.9	97.9	101.3	102.5	103.2	102.1
1949	100.0	100.0	100.0	100.0	100.9	100.0	101.6	100.0	99.1	100.0	98.4
1950	106.7	101.7	100.8	104.9	104.3	105.9	105.5	95.3	95.8	94.4	94.8
1951	115.9	107.9	104.9	107.4	107.9	110.5	109.5	93.1	92.7	90.5	91.3
1952	120.2	110.8	106.6	108.4	111.6	112.7	113.7	92.2	89.6	86.7	87.9
1953	128.9	114.2	110.5	112.9	115.4	116.6	118.1	88.6	86.7	85.7	84.7
1954	126.0	109.3	103.9	115.2	119.3	121.3	122.6	86.8	83.8	82.4	81.6
1955	138.3	112.1	107.0	123.3	123.3	129.2	127.2	81.1	81.1	77.4	78.6
1956	151.2	116.8	112.3	129.5	127.5	134.7	132.1	77.2	78.4	74.2	75.7
1957	150.9	117.3	111.3	128.6	131.9	135.5	137.1	77.7	75.8	73.8	72.9
1958	148.0	111.5	105.8	132.8	136.3	139.9	142.4	75.3	73.3	71.5	70.2
1959	159.0	112.8	107.8	140.9	141.0	147.5	147.8	71.0	70.9	67.8	67.7
1960	161.2	111.4	105.6	144.7	145.8	152.7	153.4	69.1	68.6	65.5	65.2
1961	166.9	110.9	104.6	150.5	150.7	159.5	159.3	66.5	66.3	62.7	62.8
1962	181.2	115.4	109.3	157.0	155.8	165.8	165.4	63.7	64.2	60.3	60.5
1963	193.9	119.0	112.7	163.0	161.1	172.1	171.7	61.4	62.1	58.1	58.3
1964	211.9	124.7	118.6	169.9	166.6	178.6	178.2	58.8	60.0	56.0	56.1
1965	230.1	130.2	123.3	176.7	172.3	186.7	185.0	56.6	58.0	53.6	54.1
1965 as % of 1946	270.1	144.7	133.6	186.6	188.7	202.2	203.7	53.6	53.0	49.5	49.1
Annual trend rate of change (%)	+ 4.8	+ 1.3	+ 0.9	+ 3.4		+ 3.8		– 3.3		– 3.7	

[1] Calculated by fitting a straight line to the logarithms of the data using the least squares method.

TABLE 3. Indexes of Output per Person Employed and per Man-hour, and of Unit Man-year and Unit Man-hour Requirements, Nonmanufacturing Industries (Commercial Nonagricultural), Canada, 1946-65

(1949 = 100)

Year	Indexes of									
	Output	Persons employed	Man-hours	Output per person employed		Output per man-hour		Unit man-year requirements		Unit man-hour requirements	
				Original data	Trend values[1]	Original data	Trend values[1]	Original data	Trend values[1]	Original data	Trend values[1]
1946	85.3	85.3	86.9	100.0	96.4	98.2	95.1	100.0	103.7	101.9	105.1
1947	92.6	93.7	94.3	98.8	98.5	98.2	97.9	101.2	101.6	101.8	102.2
1948	95.8	97.4	97.7	98.4	100.5	98.0	100.7	101.6	99.5	102.0	99.3
1949	100.0	100.0	100.0	100.0	102.7	100.0	103.7	100.0	97.4	100.0	96.5
1950	106.7	102.2	99.7	104.5	104.8	107.0	106.7	95.7	95.4	93.4	93.7
1951	113.2	107.5	104.7	105.3	107.0	108.1	109.8	95.0	93.4	92.5	91.1
1952	119.2	110.2	106.5	108.2	109.3	111.9	113.0	92.4	91.5	89.3	88.5
1953	124.2	111.0	106.2	111.9	111.6	117.0	116.3	89.4	89.6	85.5	86.0
1954	126.0	111.2	105.4	113.2	113.9	119.5	119.7	88.3	87.8	83.7	83.6
1955	137.1	115.2	108.3	119.0	116.3	126.5	123.2	84.0	86.0	79.0	81.2
1956	150.7	123.3	116.3	122.2	118.8	129.6	126.7	81.8	84.2	77.2	78.9
1957	154.9	128.4	118.7	120.6	121.3	130.5	130.4	82.9	82.5	76.7	76.7
1958	157.3	126.5	115.4	124.4	123.8	136.3	134.2	80.4	80.8	73.4	74.5
1959	166.4	130.4	119.0	127.5	126.4	139.7	138.1	78.4	79.1	71.6	72.4
1960	168.6	131.0	118.7	128.7	129.1	142.1	142.2	77.7	77.5	70.4	70.3
1961	172.8	132.1	117.4	130.8	131.8	147.2	146.3	76.4	75.9	67.9	68.3
1962	180.8	135.3	121.2	133.7	134.6	149.2	150.6	74.8	74.3	67.0	66.4
1963	189.8	138.2	123.1	137.3	137.4	154.2	155.0	72.8	72.8	64.8	64.5
1964	202.7	144.2	128.5	140.6	140.3	157.8	159.5	71.1	71.3	63.4	62.7
1965	216.4	151.6	133.3	142.7	143.3	162.3	164.1	70.1	69.8	61.6	60.9
1965 as % of 1946	253.8	177.8	153.5	142.7	148.6	165.4	172.5	70.1	67.3	60.5	58.0
Annual trend rate of change (%)	+ 4.8	+ 2.6	+ 1.8	+ 2.1		+ 2.9		– 2.1		– 2.8	

[1] Calculated by fitting a straight line to the logarithms of the data using the least squares method.

TABLE 4. Indexes of Output per Person Employed and per Man-hour, and of Unit Man-year and Unit Man-hour Requirements, Agriculture, Canada, 1946-65

(1949 = 100)

Year	Indexes of									
	Output	Persons employed	Man-hours	Output per person employed		Output per man-hour		Unit man-year requirements		Unit man-hour requirements	
				Original data	Trend values[1]	Original data	Trend values[1]	Original data	Trend values[1]	Original data	Trend values[1]
1946	109.4	109.4	112.1	100.0	100.4	97.6	98.6	100.0	99.6	102.5	101.5
1947	102.8	103.5	102.4	99.3	105.8	100.4	104.0	100.7	94.5	99.6	96.2
1948	106.1	101.1	100.8	104.9	111.4	105.3	109.7	95.3	89.7	95.0	91.1
1949	100.0	100.0	100.0	100.0	117.4	100.0	115.8	100.0	85.2	100.0	86.4
1950	106.2	93.9	91.8	113.1	123.6	115.7	122.2	88.4	80.9	86.4	81.9
1951	120.9	86.6	86.2	139.6	130.2	140.3	128.9	71.6	76.8	71.3	77.6
1952	148.8	82.2	82.6	181.0	137.2	180.2	136.0	55.2	72.9	55.5	73.5
1953	136.3	79.2	81.1	172.2	144.5	168.0	143.5	58.1	69.2	59.5	69.7
1954	104.3	81.0	83.9	128.8	152.2	124.4	151.4	77.7	65.7	80.4	66.0
1955	132.1	75.6	78.4	174.9	160.3	168.5	159.8	57.2	62.4	59.3	62.6
1956	141.7	71.6	74.8	198.0	168.8	189.4	168.6	50.5	59.2	52.8	59.3
1957	117.5	68.6	70.9	171.2	177.8	165.7	177.9	58.4	56.2	60.3	56.2
1958	125.1	65.7	66.7	190.5	187.3	187.5	187.7	52.5	53.4	53.3	53.3
1959	125.1	63.8	64.7	196.0	197.3	193.4	198.1	51.0	50.7	51.7	50.5
1960	127.9	62.3	62.9	205.5	207.8	203.5	209.0	48.7	48.1	49.1	47.9
1961	116.0	62.2	61.6	186.5	218.9	188.3	220.5	53.6	45.7	53.1	45.3
1962	134.7	60.2	59.3	223.6	230.5	227.2	232.7	44.7	43.4	44.0	43.0
1963	147.5	59.1	57.4	249.5	242.8	256.9	245.5	40.1	41.2	38.9	40.7
1964	140.2	57.6	55.1	243.6	255.8	254.7	259.0	41.0	39.1	39.3	38.6
1965	149.9	54.2	51.4	276.4	269.4	292.0	273.3	36.2	37.1	34.3	36.6
1965 as % of 1946	137.1	49.6	45.8	276.5	268.2	299.1	277.4	36.2	37.3	33.4	36.1
Annual trend rate of change (%)	+ 1.5	– 3.6	– 3.8	+ 5.3		+ 5.5		– 5.1		– 5.2	

[1] Calculated by fitting a straight line to the logarithms of the data using the least squares method.

TABLE 5. Indexes of Output per Person Employed and per Man-hour, and of Unit Man-year and Unit Man-hour Requirements, Commercial Industries, Canada, 1946-65

(1949 = 100)

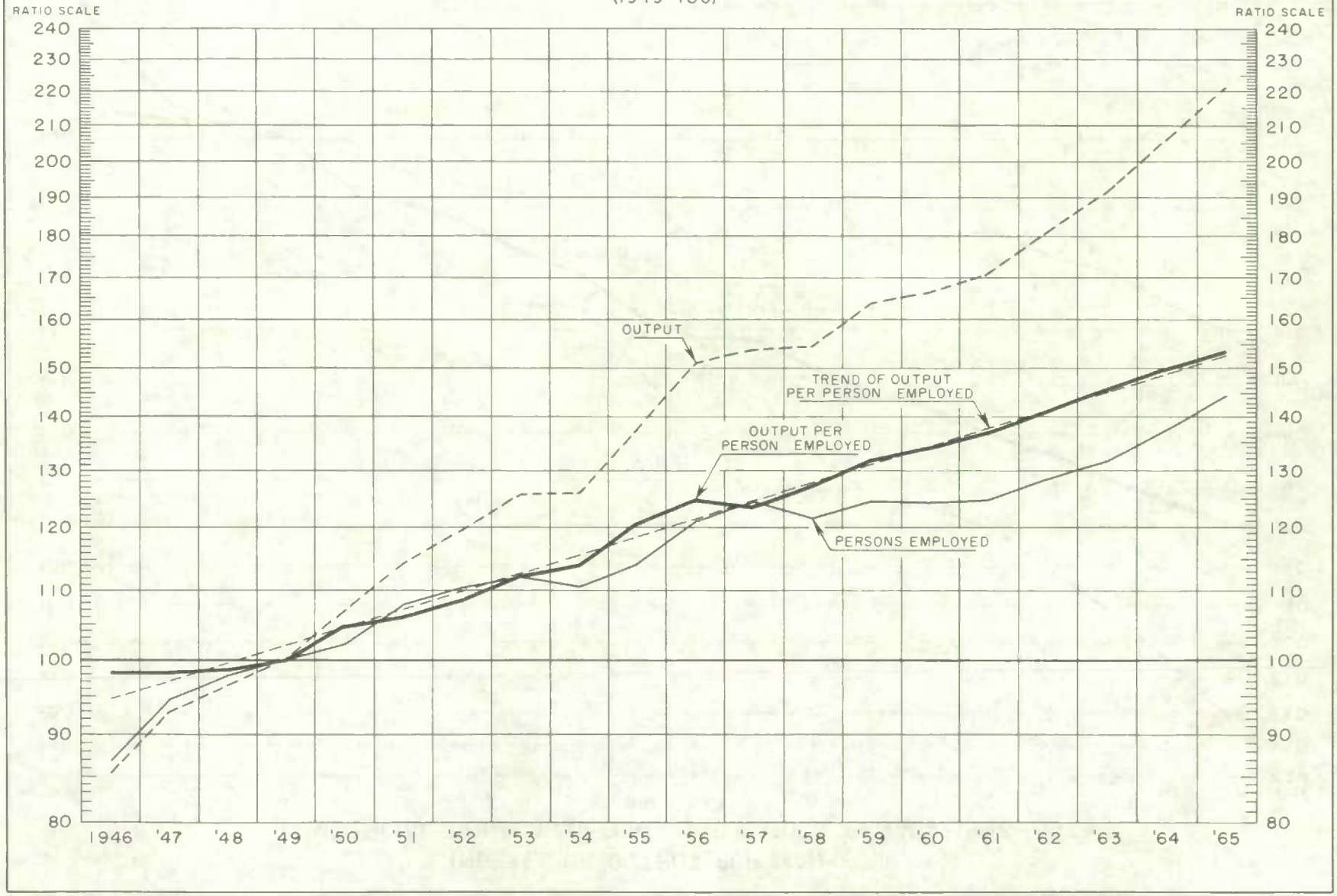
Year	Indexes of									
	Output	Persons employed	Man-hours	Output per person employed		Output per man-hour		Unit man-year requirements		Unit man-hour requirements	
				Original data	Trend values[1]	Original data	Trend values[1]	Original data	Trend values[1]	Original data	Trend values[1]
1946	88.1	92.4	95.3	95.3	94.7	92.4	93.1	104.9	105.6	108.2	107.4
1947	94.0	96.8	97.4	97.1	97.8	96.5	96.9	103.0	102.2	103.6	103.2
1948	97.4	98.6	99.2	98.8	101.0	98.2	100.9	101.2	99.0	101.8	99.1
1949	100.0	100.0	100.0	100.0	104.3	100.0	105.0	100.0	95.8	100.0	95.2
1950	106.7	100.0	97.7	106.6	107.8	109.2	109.3	93.8	92.8	91.6	91.5
1951	114.9	102.5	99.5	112.1	111.3	115.5	113.7	89.2	89.8	86.6	87.9
1952	123.0	103.5	99.7	118.8	115.0	123.3	118.4	84.2	87.0	81.1	84.5
1953	127.0	104.0	100.0	122.1	118.8	127.0	123.2	81.9	84.2	78.7	81.2
1954	123.4	103.3	98.9	119.5	122.7	124.8	128.2	83.7	81.5	80.1	78.0
1955	136.8	104.7	99.5	130.7	126.7	137.6	133.4	76.5	78.9	72.7	75.0
1956	149.8	108.9	103.5	137.5	130.9	144.7	138.9	72.7	76.4	69.1	72.0
1957	149.3	110.8	103.4	134.7	135.2	144.5	144.5	74.2	74.0	69.2	69.2
1958	150.8	107.7	99.3	140.0	139.6	151.8	150.4	71.4	71.6	65.9	66.5
1959	159.3	109.5	101.0	145.5	144.2	157.8	156.5	68.7	69.4	63.4	63.9
1960	161.7	109.0	99.8	148.3	148.9	162.0	162.9	67.4	67.1	61.7	61.4
1961	164.4	109.4	98.6	150.3	153.8	166.8	169.6	66.5	65.0	60.0	59.0
1962	175.6	111.7	100.8	157.2	158.9	174.1	176.5	63.6	62.9	57.4	56.7
1963	186.1	113.8	101.9	163.5	164.1	182.5	183.6	61.1	60.9	54.8	54.5
1964	198.2	117.9	105.3	168.1	169.5	188.3	191.1	59.5	59.0	53.1	52.3
1965	212.7	122.2	107.6	174.1	175.1	197.7	198.9	57.4	57.1	50.6	50.3
1965 as % of 1946	241.5	132.2	112.9	182.7	184.9	213.9	213.6	54.7	54.1	46.7	46.8
Annual trend rate of change (%)	+ 4.4	+ 1.1	+ 0.3	+ 3.3		+ 4.1		- 3.2		- 3.9	

[1] Calculated by fitting a straight line to the logarithms of the data using the least squares method.

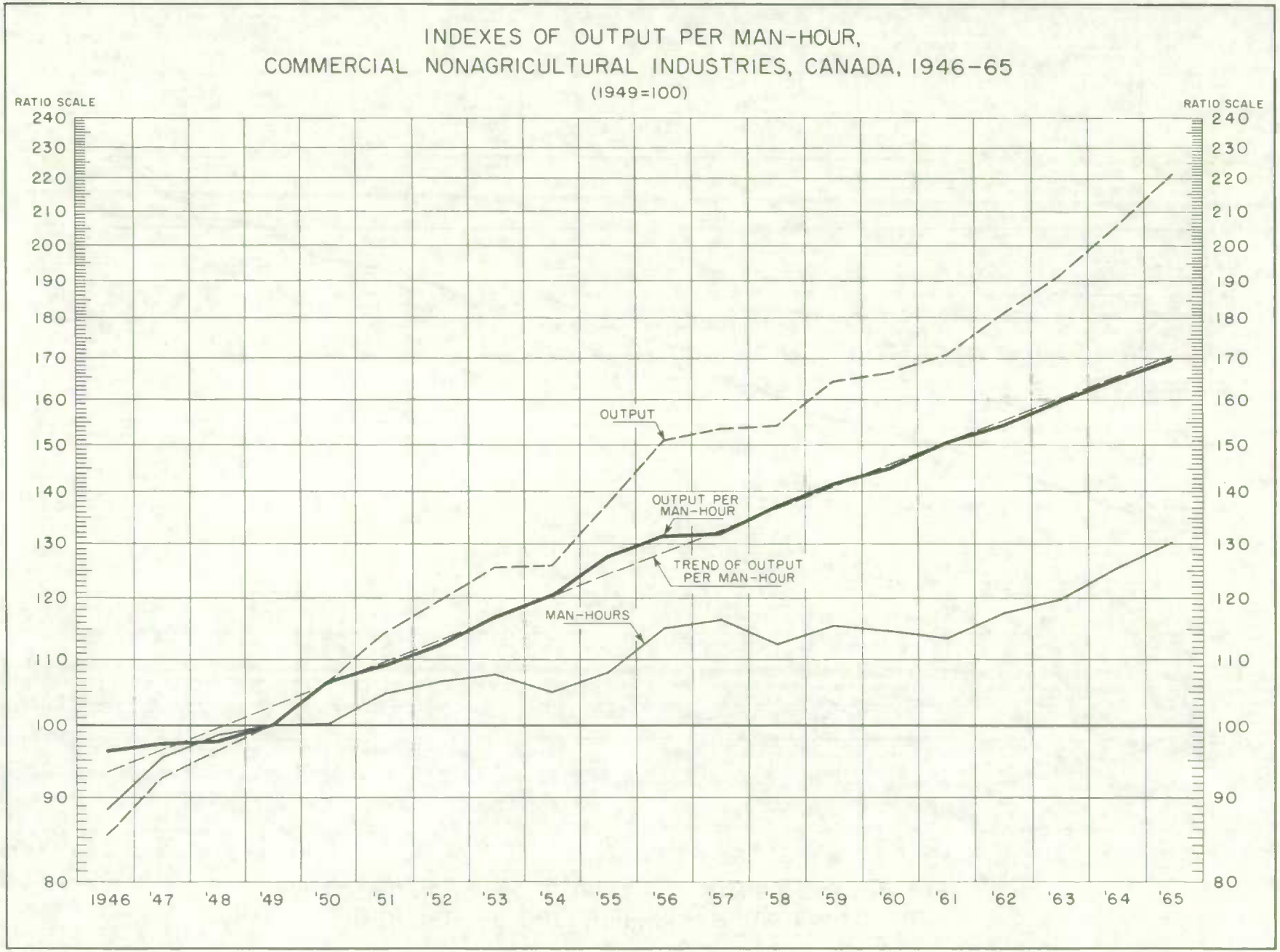
CHART-1

INDEXES OF OUTPUT PER PERSON EMPLOYED, COMMERCIAL NONAGRICULTURAL INDUSTRIES, CANADA, 1946-65

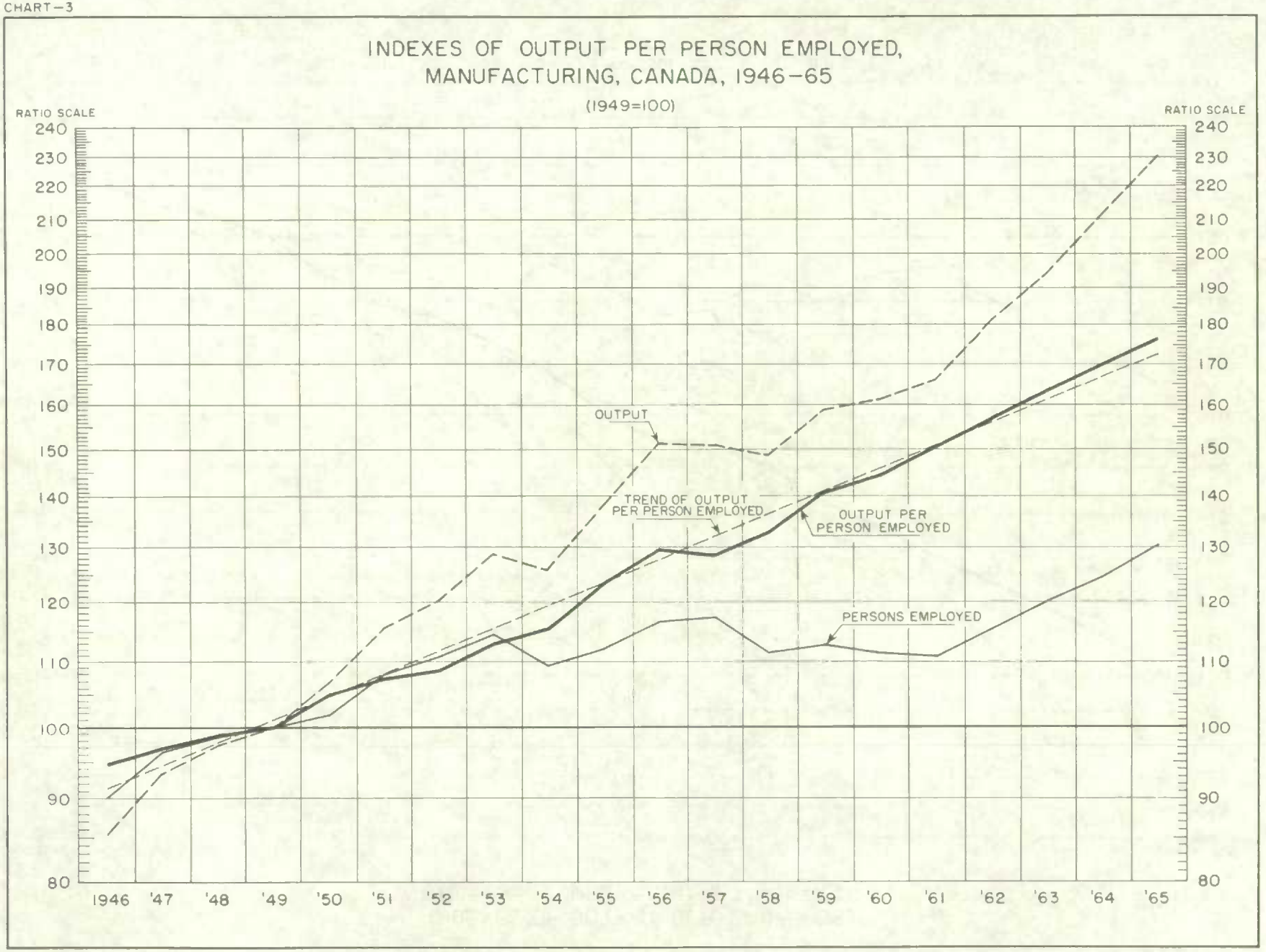
(1949=100)



CHART–2


INDEXES OF OUTPUT PER MAN-HOUR,
COMMERCIAL NONAGRICULTURAL INDUSTRIES, CANADA, 1946–65
(1949=100)
RATIO SCALE
RATIO SCALE
240
230
220
210
200
190
180
170
160
150
140
130
120
110
100
90
80
OUTPUT
OUTPUT PER MAN-HOUR
TREND OF OUTPUT PER MAN-HOUR
MAN-HOURS
1946
'47
'48
'49
'50
'51
'52
'53
'54
'55
'56
'57
'58
'59
'60
'61
'62
'63
'64
'65

CHART–3


INDEXES OF OUTPUT PER PERSON EMPLOYED,
MANUFACTURING, CANADA, 1946–65
(1949=100)
RATIO SCALE
RATIO SCALE
240
230
220
210
200
190
180
170
160
150
140
130
120
110
100
90
80
OUTPUT
TREND OF OUTPUT PER PERSON EMPLOYED
OUTPUT PER PERSON EMPLOYED
PERSONS EMPLOYED
1946
'47
'48
'49
'50
'51
'52
'53
'54
'55
'56
'57
'58
'59
'60
'61
'62
'63
'64
'65

CHART–4

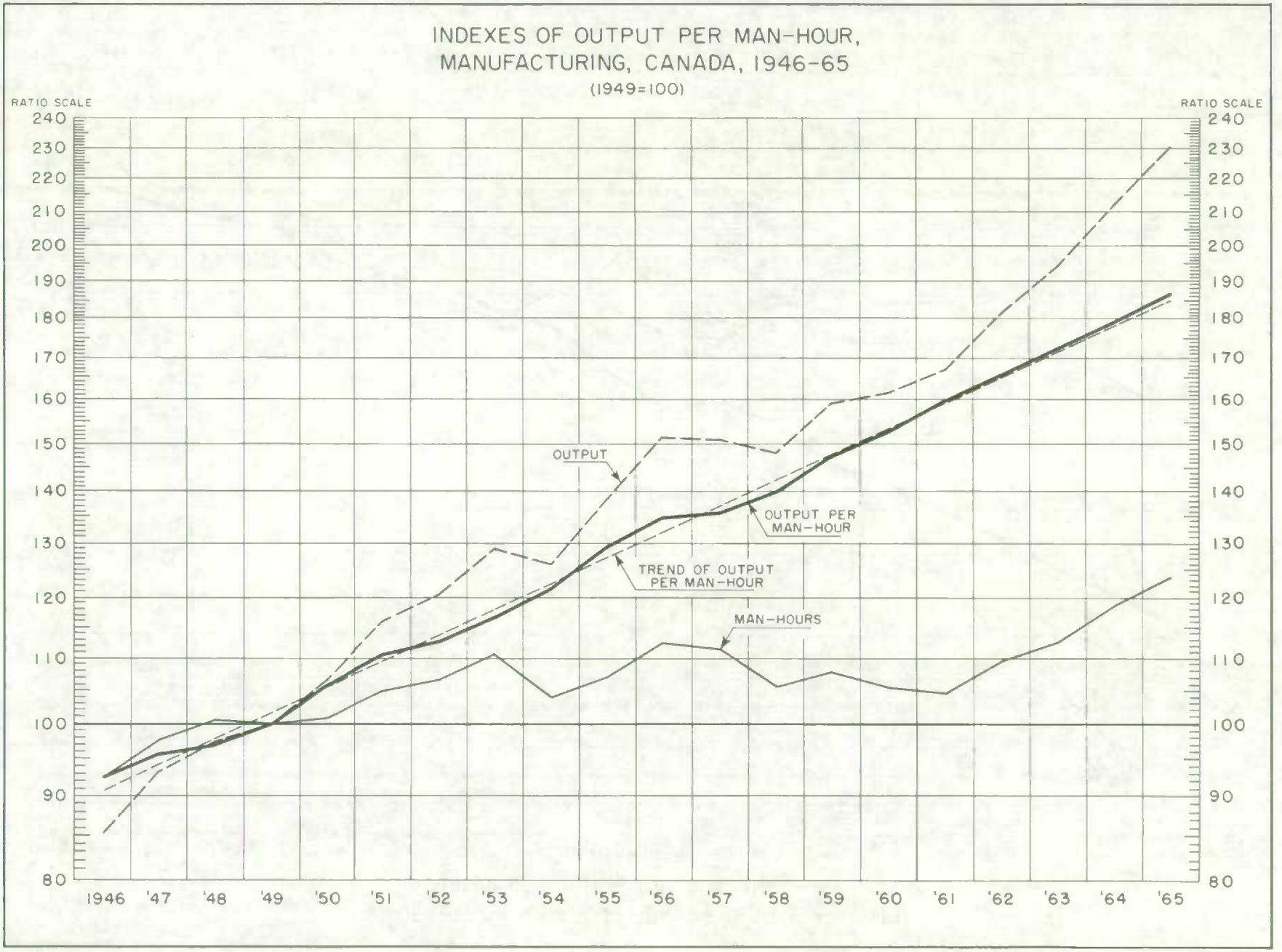

INDEXES OF OUTPUT PER MAN-HOUR,
MANUFACTURING, CANADA, 1946-65
(1949=100)
RATIO SCALE
RATIO SCALE
240
230
220
210
200
190
180
170
160
150
140
130
120
110
100
90
80
OUTPUT
OUTPUT PER MAN-HOUR
TREND OF OUTPUT PER MAN-HOUR
MAN-HOURS
1946
'47
'48
'49
'50
'51
'52
'53
'54
'55
'56
'57
'58
'59
'60
'61
'62
'63
'64
'65

CHART-5

INDEXES OF OUTPUT PER PERSON EMPLOYED, NONMANUFACTURING INDUSTRIES (COMMERCIAL NONAGRICULTURAL), CANADA, 1946–65

(1949 = 100)

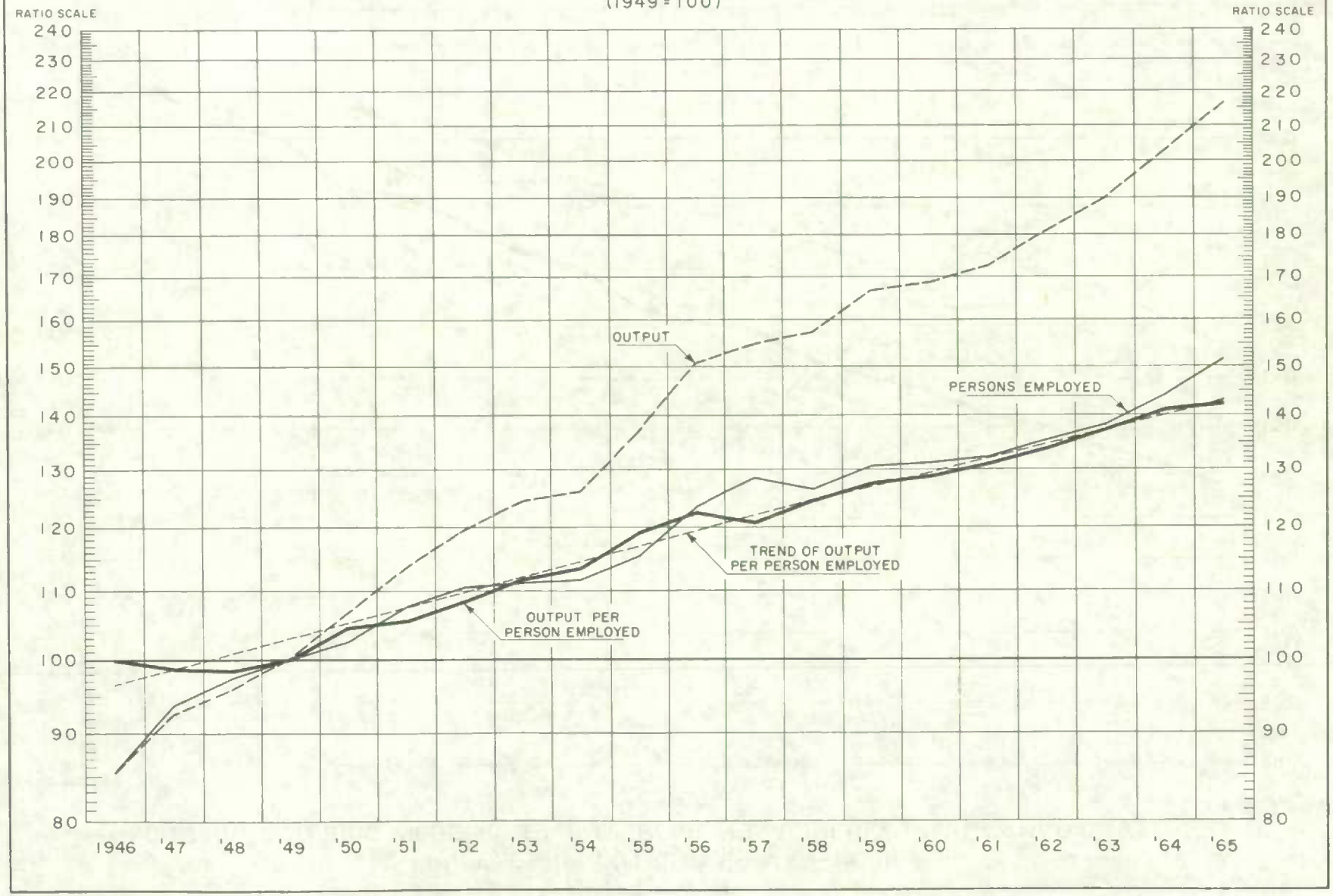


CHART-6

INDEXES OF OUTPUT PER MAN-HOUR, NONMANUFACTURING INDUSTRIES (COMMERCIAL NONAGRICULTURAL), CANADA, 1946-65

(1949=100)

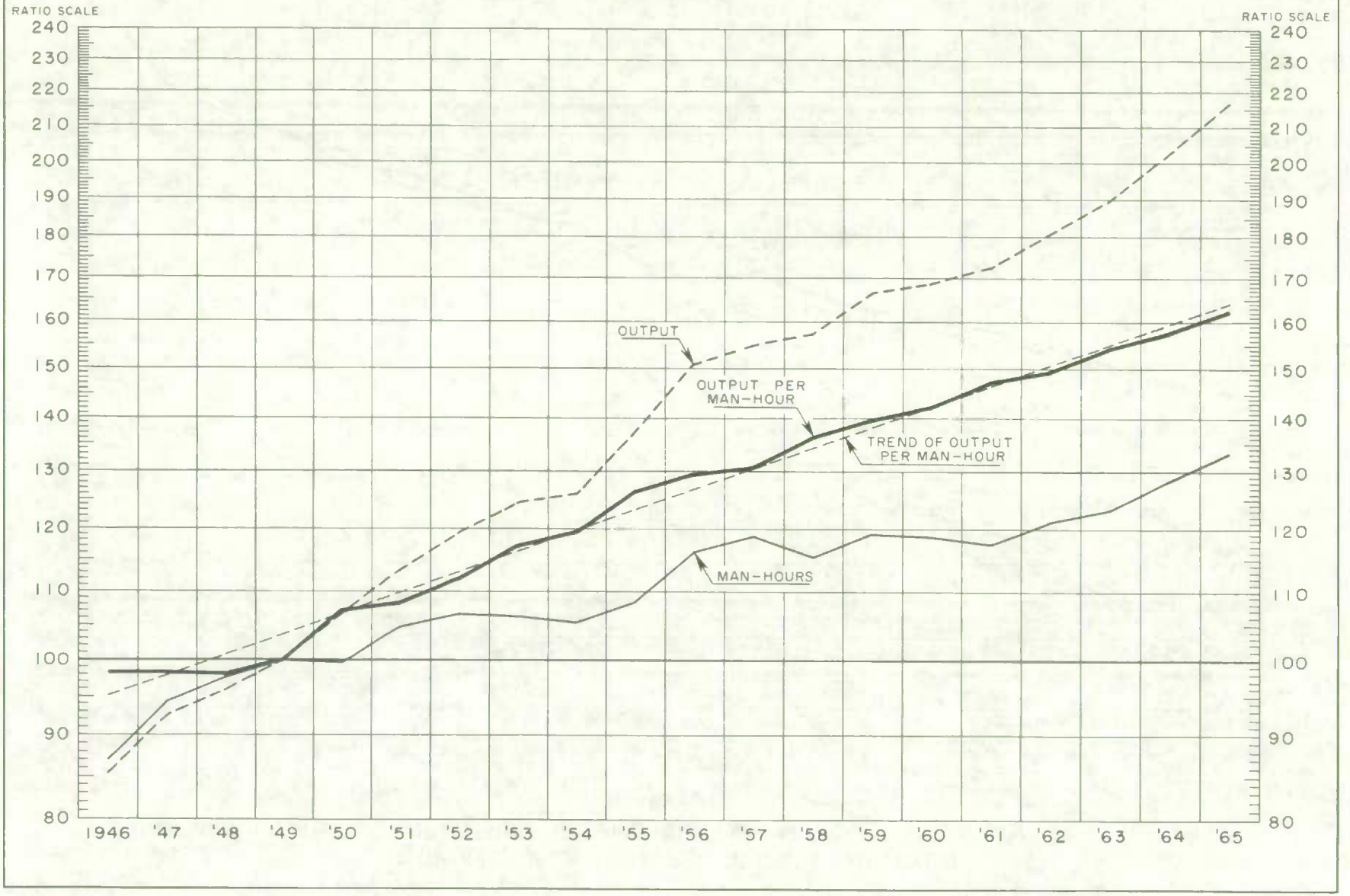
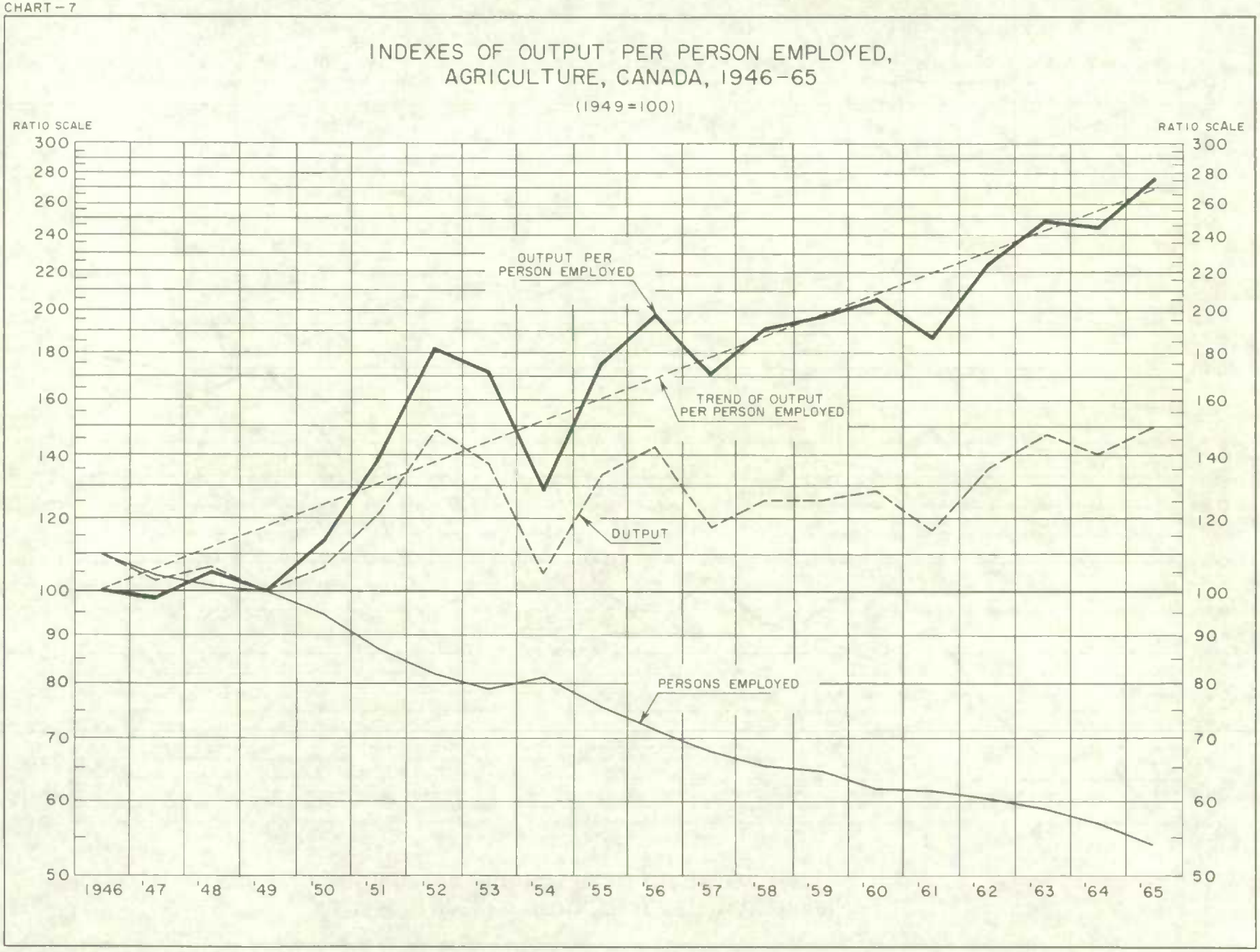
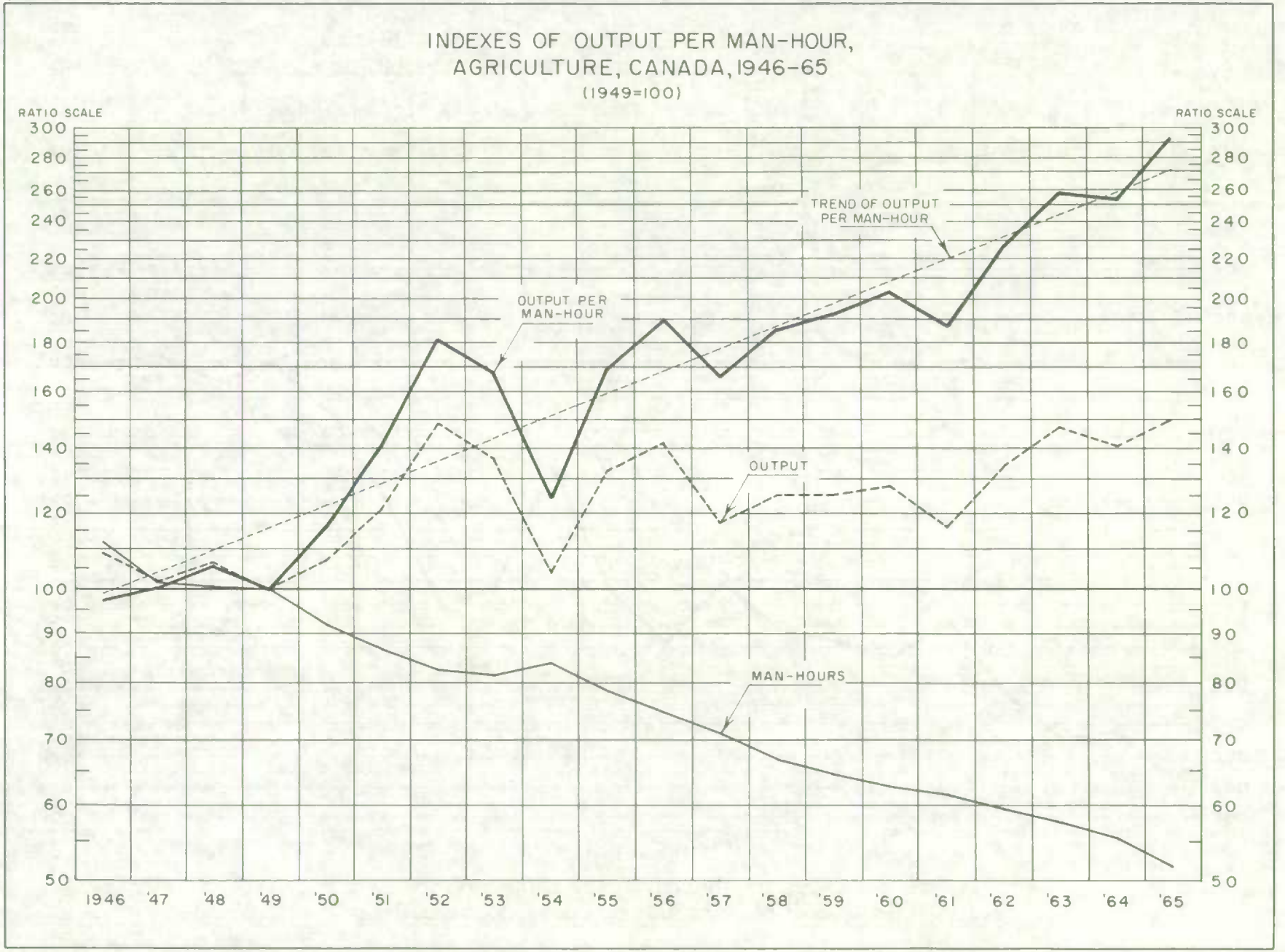


CHART – 7


INDEXES OF OUTPUT PER PERSON EMPLOYED,
AGRICULTURE, CANADA, 1946–65
(1949=100)
RATIO SCALE
RATIO SCALE
300
280
260
240
220
200
180
160
140
120
100
90
80
70
60
50
OUTPUT PER PERSON EMPLOYED
TREND OF OUTPUT PER PERSON EMPLOYED
OUTPUT
PERSONS EMPLOYED
1946
'47
'48
'49
'50
'51
'52
'53
'54
'55
'56
'57
'58
'59
'60
'61
'62
'63
'64
'65

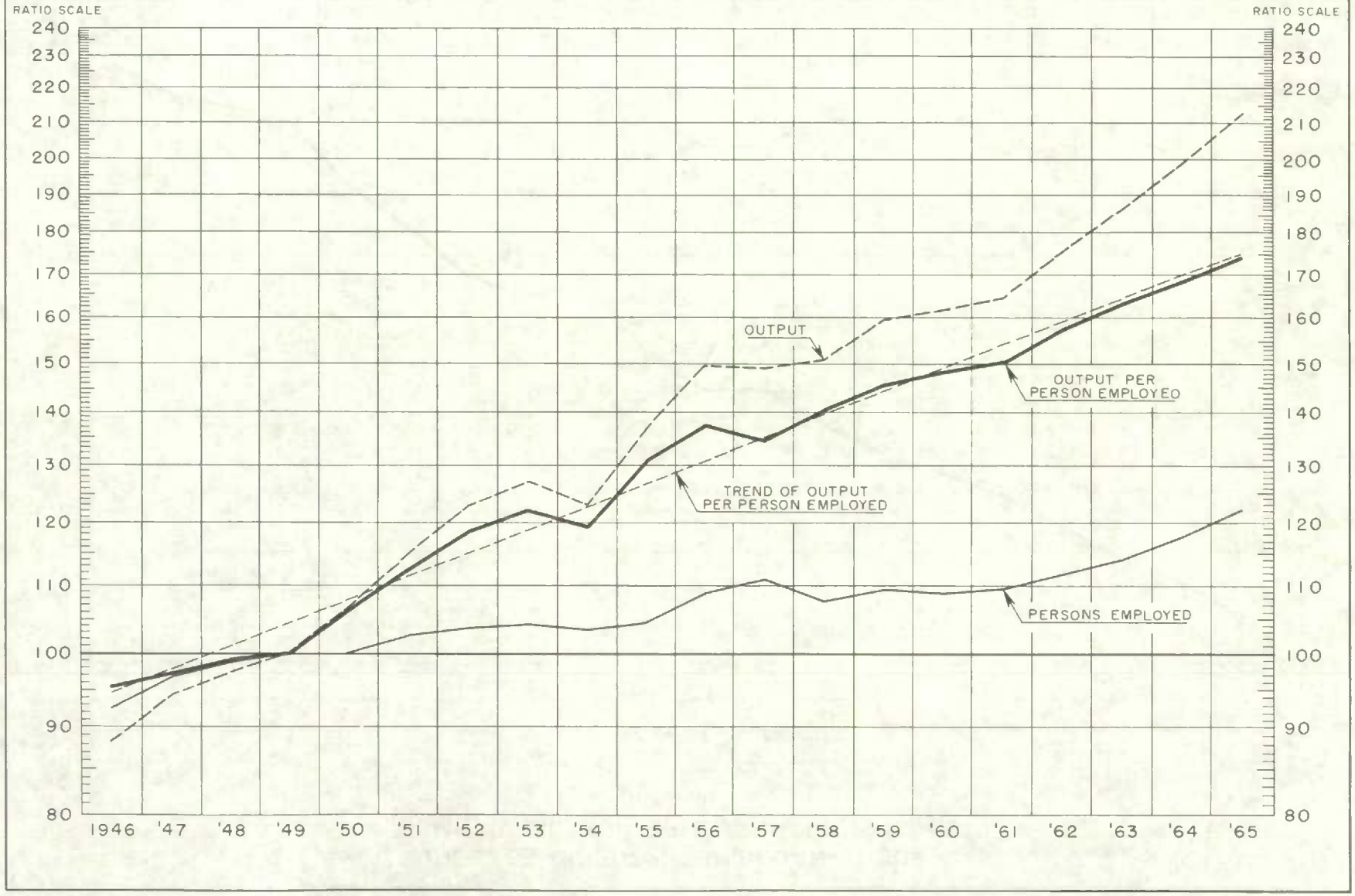
CHART–8


INDEXES OF OUTPUT PER MAN-HOUR,
AGRICULTURE, CANADA, 1946–65
(1949=100)
RATIO SCALE
RATIO SCALE
300
280
260
240
220
200
180
160
140
120
100
90
80
70
60
50
TREND OF OUTPUT PER MAN-HOUR
OUTPUT PER MAN-HOUR
OUTPUT
MAN-HOURS
1946
'47
'48
'49
'50
'51
'52
'53
'54
'55
'56
'57
'58
'59
'60
'61
'62
'63
'64
'65

CHART–9

INDEXES OF OUTPUT PER PERSON EMPLOYED, COMMERCIAL INDUSTRIES, CANADA, 1946–65

(1949=100)



CHART–10

INDEXES OF OUTPUT PER MAN–HOUR, COMMERCIAL INDUSTRIES, CANADA, 1946–65

(1949=100)

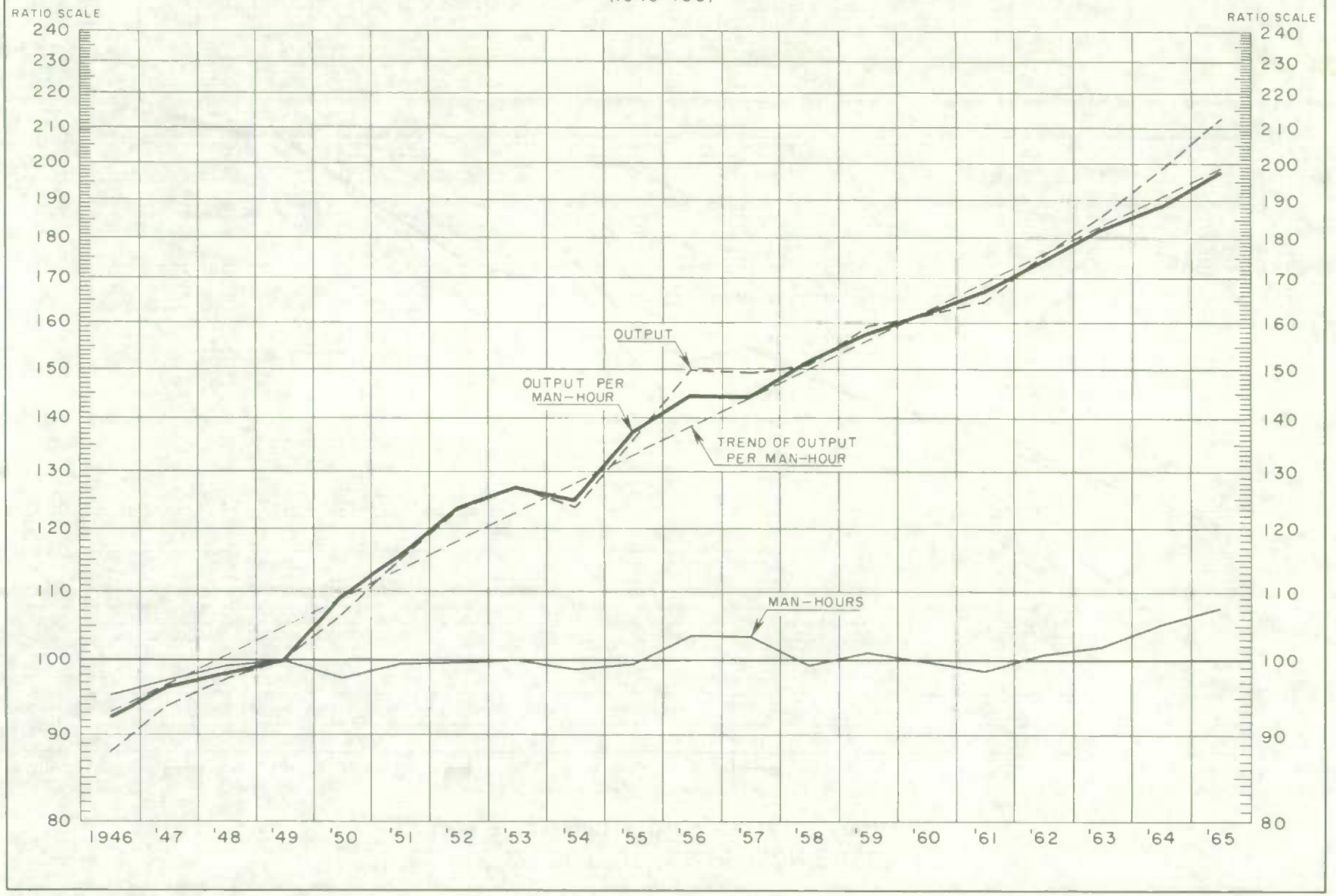


CHART - II

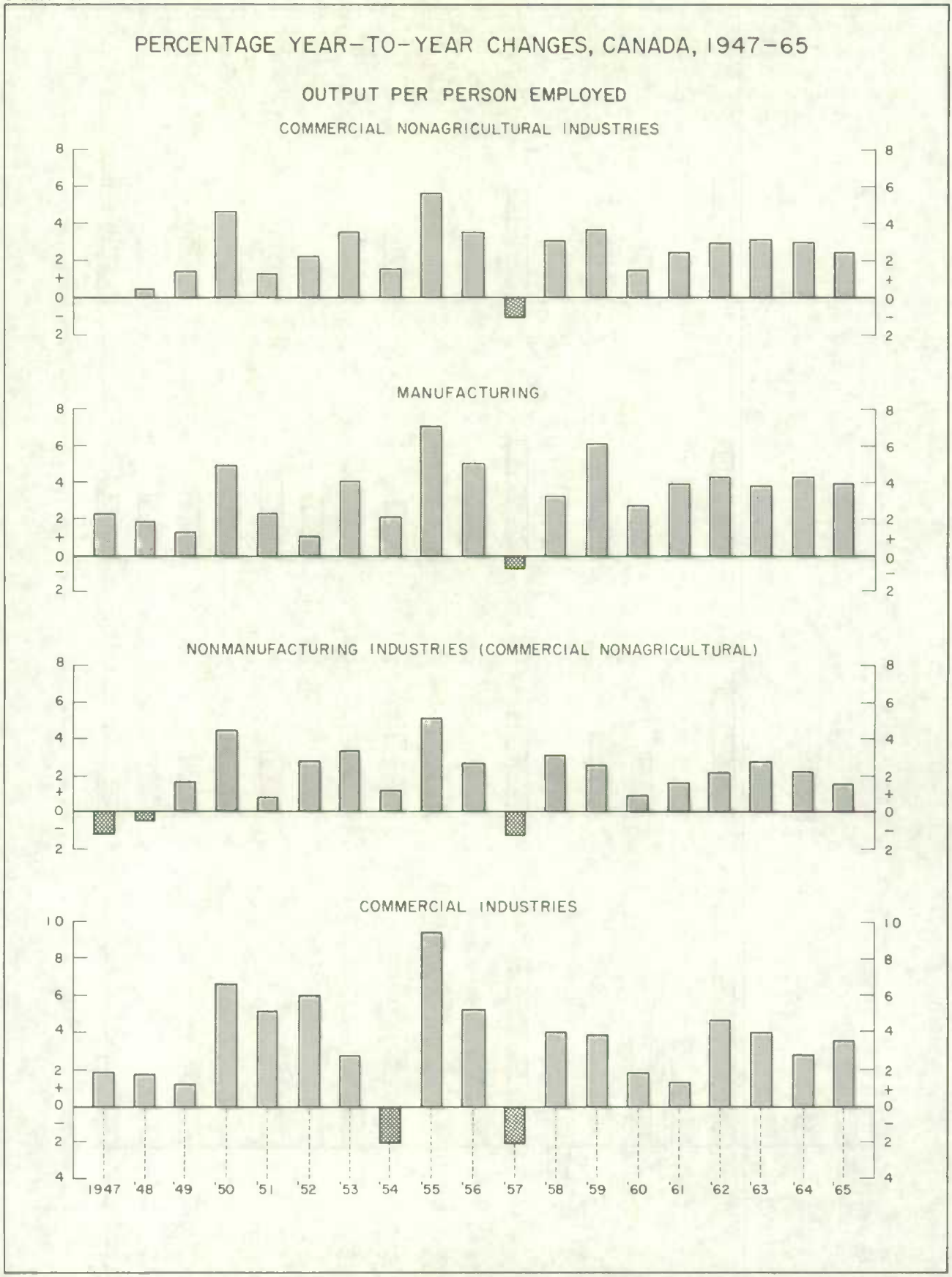

PERCENTAGE YEAR-TO-YEAR CHANGES, CANADA, 1947-65
OUTPUT PER PERSON EMPLOYED
COMMERCIAL NONAGRICULTURAL INDUSTRIES
MANUFACTURING
NONMANUFACTURING INDUSTRIES (COMMERCIAL NONAGRICULTURAL)
COMMERCIAL INDUSTRIES
8
6
4
2
+
0
-
2
10
4
1947
'48
'49
'50
'51
'52
'53
'54
'55
'56
'57
'58
'59
'60
'61
'62
'63
'64
'65

CHART – 12

PERCENTAGE YEAR-TO-YEAR CHANGES, CANADA, 1947-65

OUTPUT PER MAN-HOUR

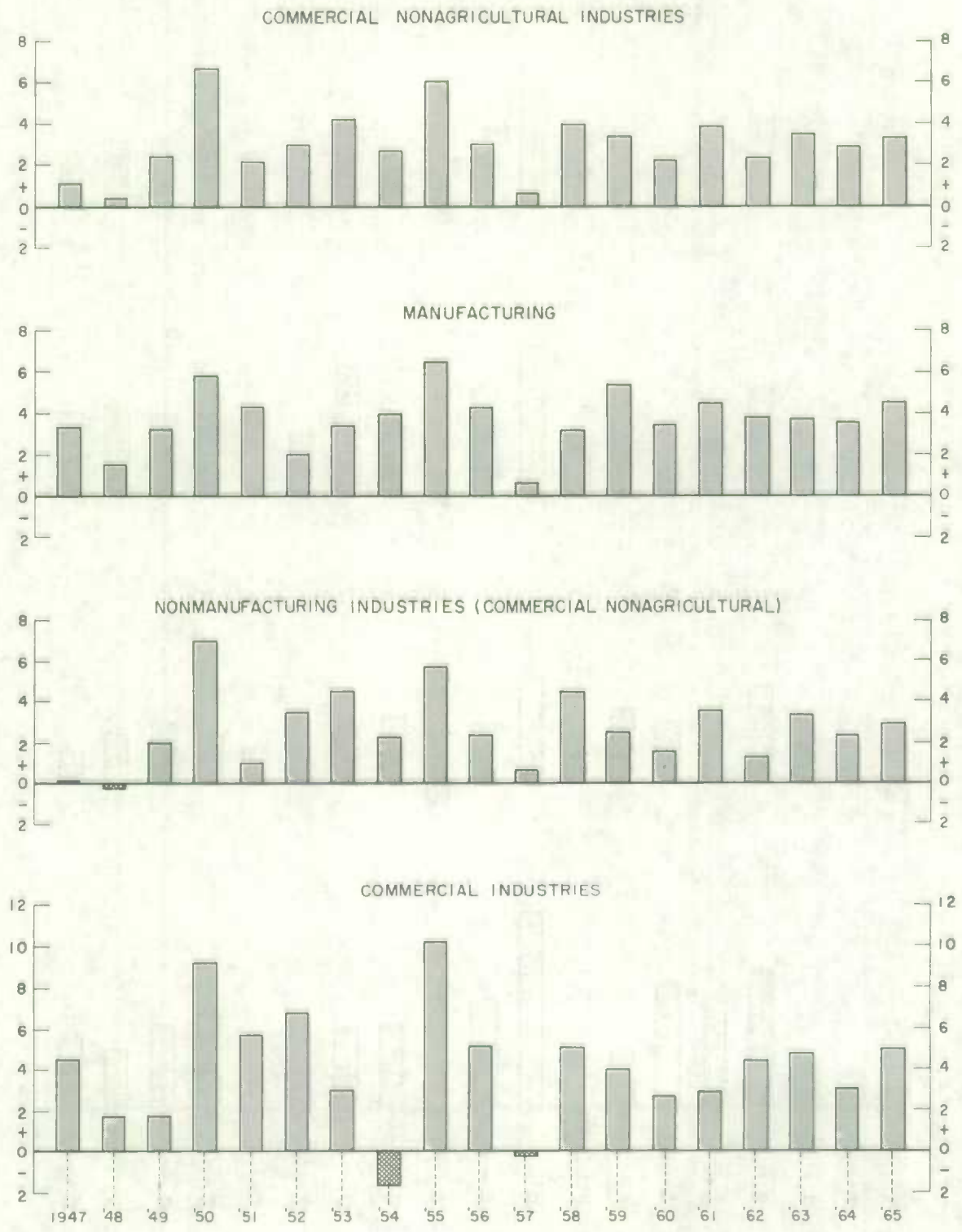
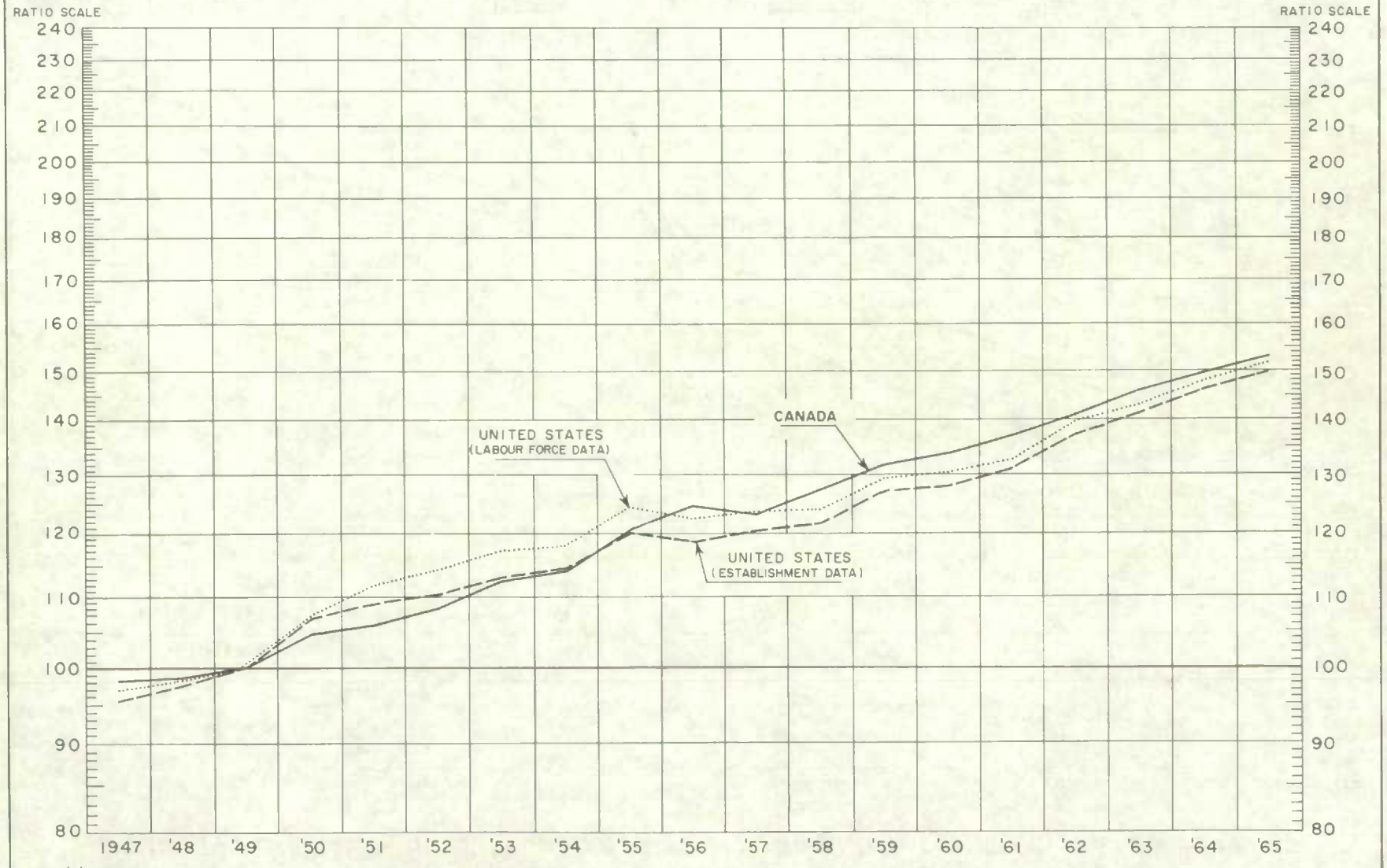


CHART – 13

INDEXES OF OUTPUT[1] PER PERSON EMPLOYED, COMMERCIAL NONAGRICULTURAL INDUSTRIES,[2] CANADA AND THE UNITED STATES, 1947 – 65

(1949 = 100)

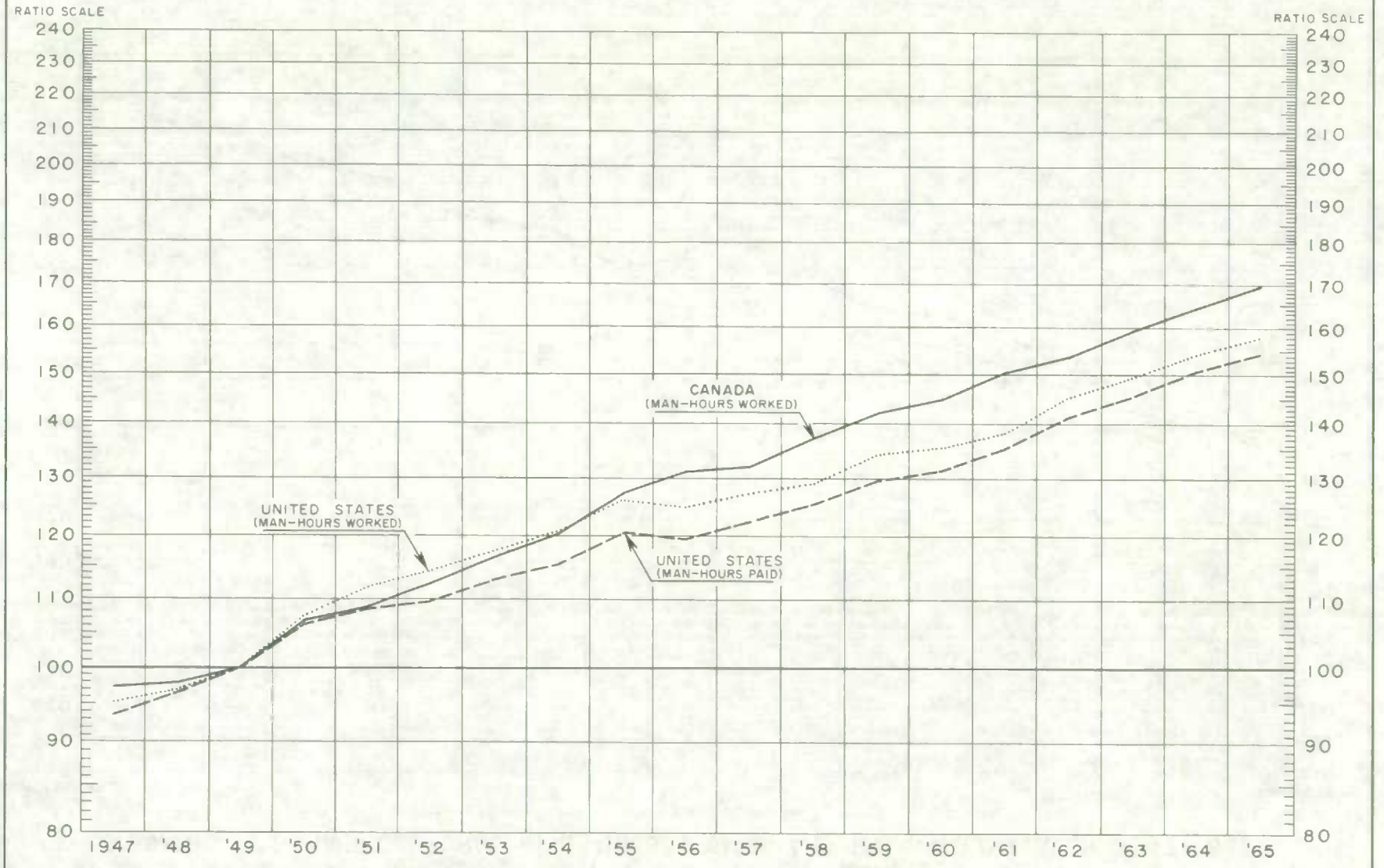


(1) UNITED STATES DATA ARE BASED ON A GROSS NATIONAL PRODUCT CONCEPT.
(2) UNITED STATES DATA COVER THE PRIVATE NONAGRICULTURAL INDUSTRIES.

CHART-14

INDEXES OF OUTPUT[1] PER MAN-HOUR, COMMERCIAL NONAGRICULTURAL INDUSTRIES,[2] CANADA AND THE UNITED STATES, 1947-65

(1949=100)

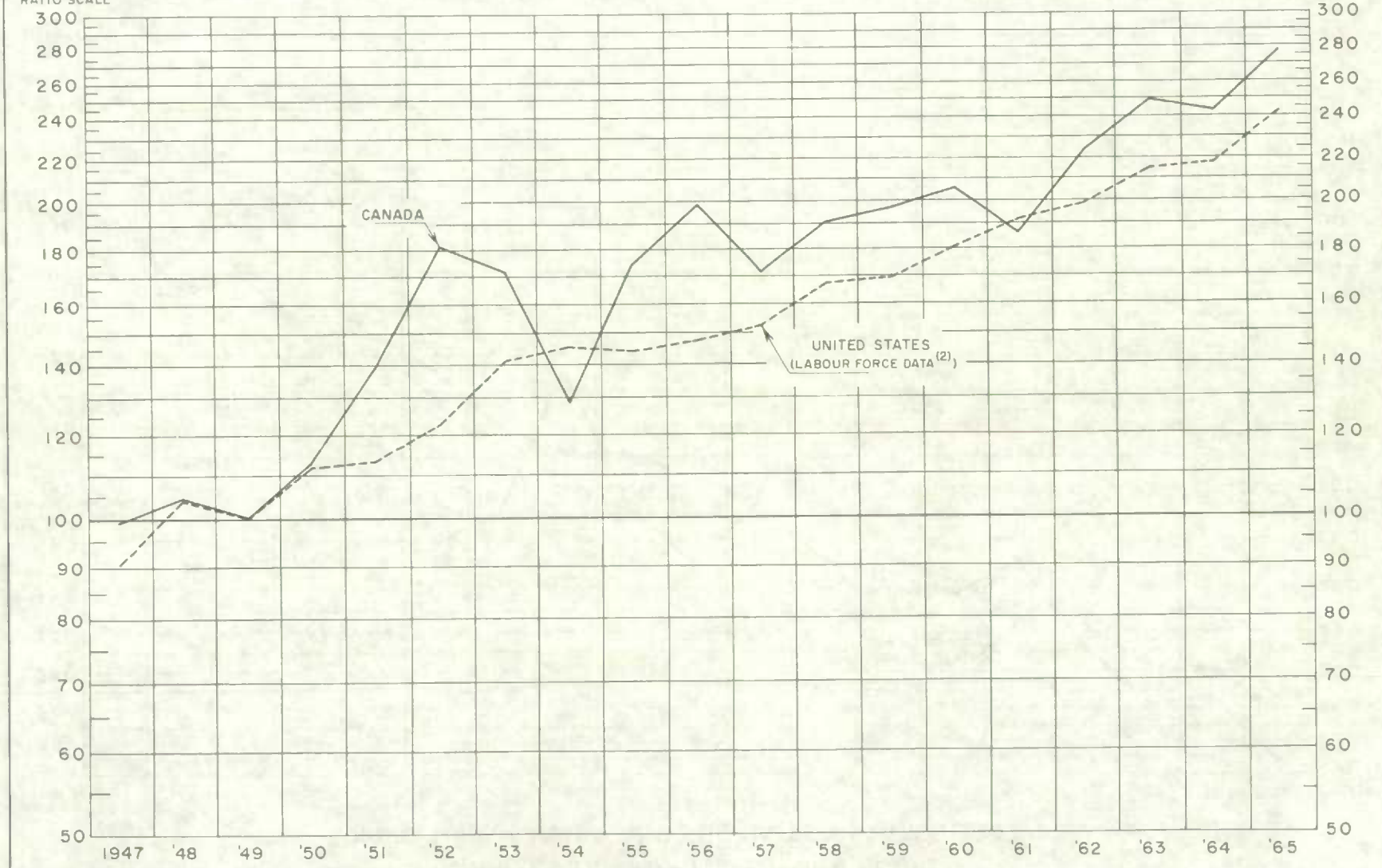


(1) UNITED STATES DATA ARE BASED ON A GROSS NATIONAL PRODUCT CONCEPT.
(2) UNITED STATES DATA COVER THE PRIVATE NONAGRICULTURAL INDUSTRIES.

CHART–15

INDEXES OF OUTPUT[1] PER PERSON EMPLOYED, AGRICULTURE, CANADA AND THE UNITED STATES, 1947–65

(1949 = 100)



[1] UNITED STATES DATA ARE BASED ON A GROSS NATIONAL PRODUCT CONCEPT.
[2] ALSO USED IN BUREAU OF LABOR STATISTICS ESTABLISHMENT–BASED PRODUCTIVITY ESTIMATES.

CHART – 16

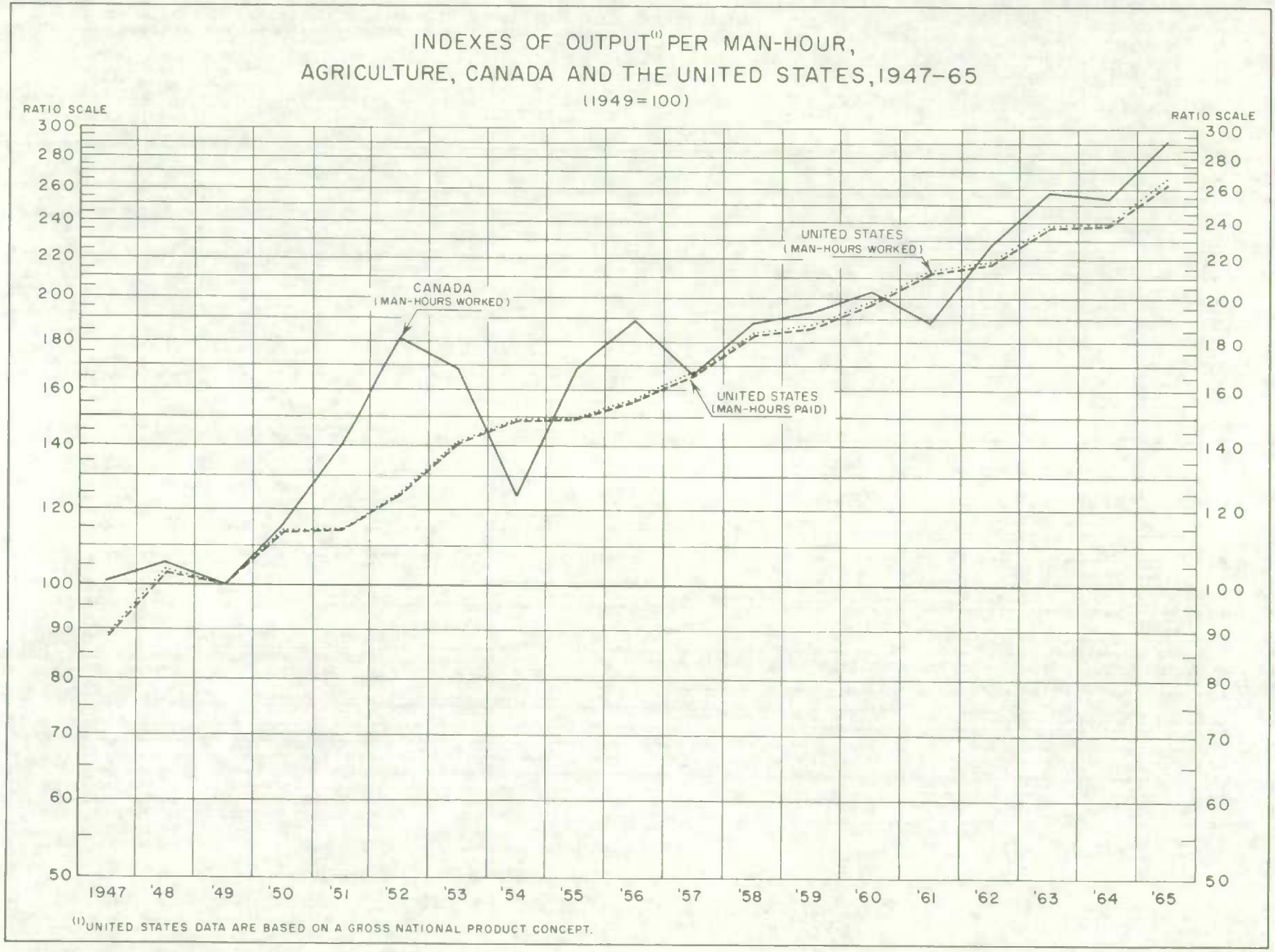
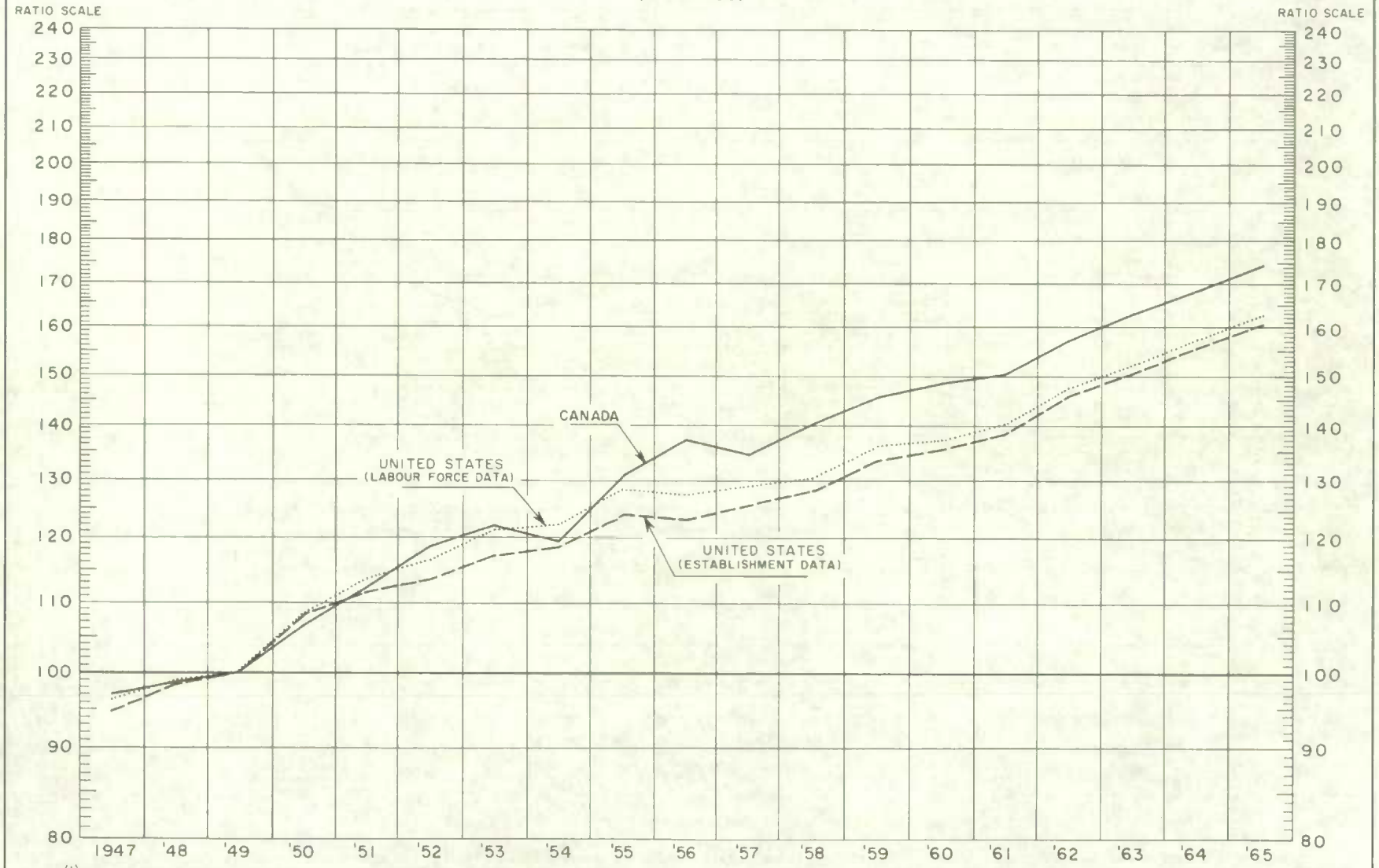

INDEXES OF OUTPUT(1) PER MAN-HOUR,
AGRICULTURE, CANADA AND THE UNITED STATES, 1947–65
(1949=100)
RATIO SCALE
RATIO SCALE
300
280
260
240
220
200
180
160
140
120
100
90
80
70
60
50
CANADA
(MAN-HOURS WORKED)
UNITED STATES
(MAN-HOURS WORKED)
UNITED STATES
(MAN-HOURS PAID)
1947
'48
'49
'50
'51
'52
'53
'54
'55
'56
'57
'58
'59
'60
'61
'62
'63
'64
'65
(1)UNITED STATES DATA ARE BASED ON A GROSS NATIONAL PRODUCT CONCEPT.

CHART – 17

INDEXES OF OUTPUT[1] PER PERSON EMPLOYED, COMMERCIAL INDUSTRIES,[2] CANADA AND THE UNITED STATES, 1947–65

(1949=100)



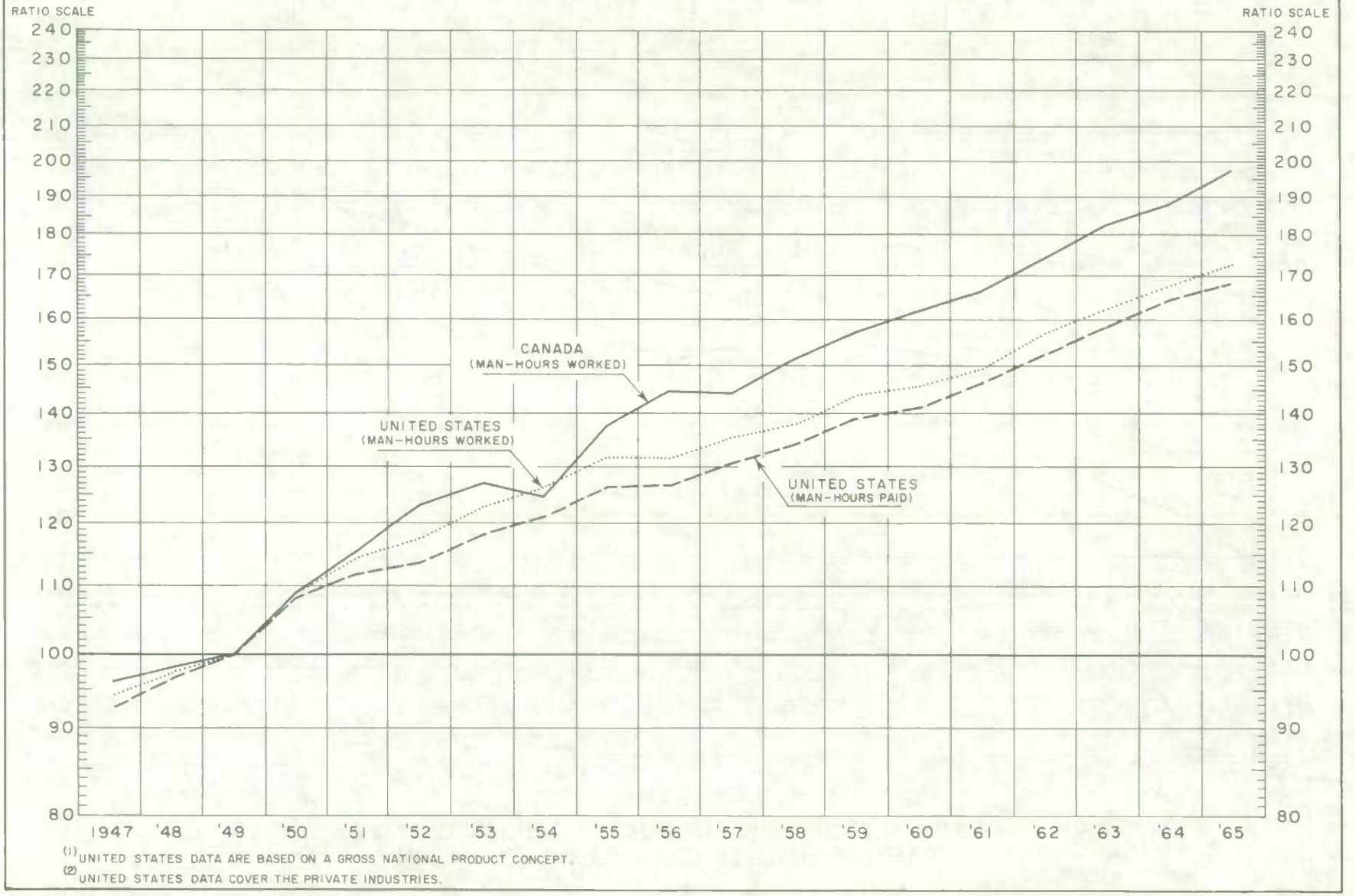
[1] UNITED STATES DATA ARE BASED ON A GROSS NATIONAL PRODUCT CONCEPT.

[2] UNITED STATES DATA COVER THE PRIVATE INDUSTRIES.

CHART – 18

INDEXES OF OUTPUT[1] PER MAN-HOUR, COMMERCIAL INDUSTRIES,[2] CANADA AND THE UNITED STATES, 1947-65

(1949 = 100)



(1) UNITED STATES DATA ARE BASED ON A GROSS NATIONAL PRODUCT CONCEPT.
(2) UNITED STATES DATA COVER THE PRIVATE INDUSTRIES.