economic review

MAY 1965

IN THIS ISSUE

FEDERAL RESERVE BANK OF CLEVELAND

PERSPECTIVE ON REGIONAL EMPLOYMENT PATTERNS

Reflecting the country's high rate of economic activity, utilization of the nation's manpower resources improved noticeably in 1964. For one thing, the nation's labor force expanded by a larger amount than during any previous year in this decade, and thus for the first time matched the amount of average annual growth projected for the 1960's. In addition, and perhaps more importantly, an even larger gain occurred in employment to allow the complete absorption of the large growth in the labor supply as well as a small reduction in the amount of unemployment. The resulting drop in the unemployment rate marked a movement off the high postrecession plateau from which the rate could not be dislodged for several years.

Against the background of national manpower developments over the past few years, this article examines whether manpower developments on a subnational level—whose economic structure may differ significantly from the national average—have followed or deviated from the broad national pattern, particularly as to the amount of growth in employment and shrinkage in unemployment from the peak levels of 1960.

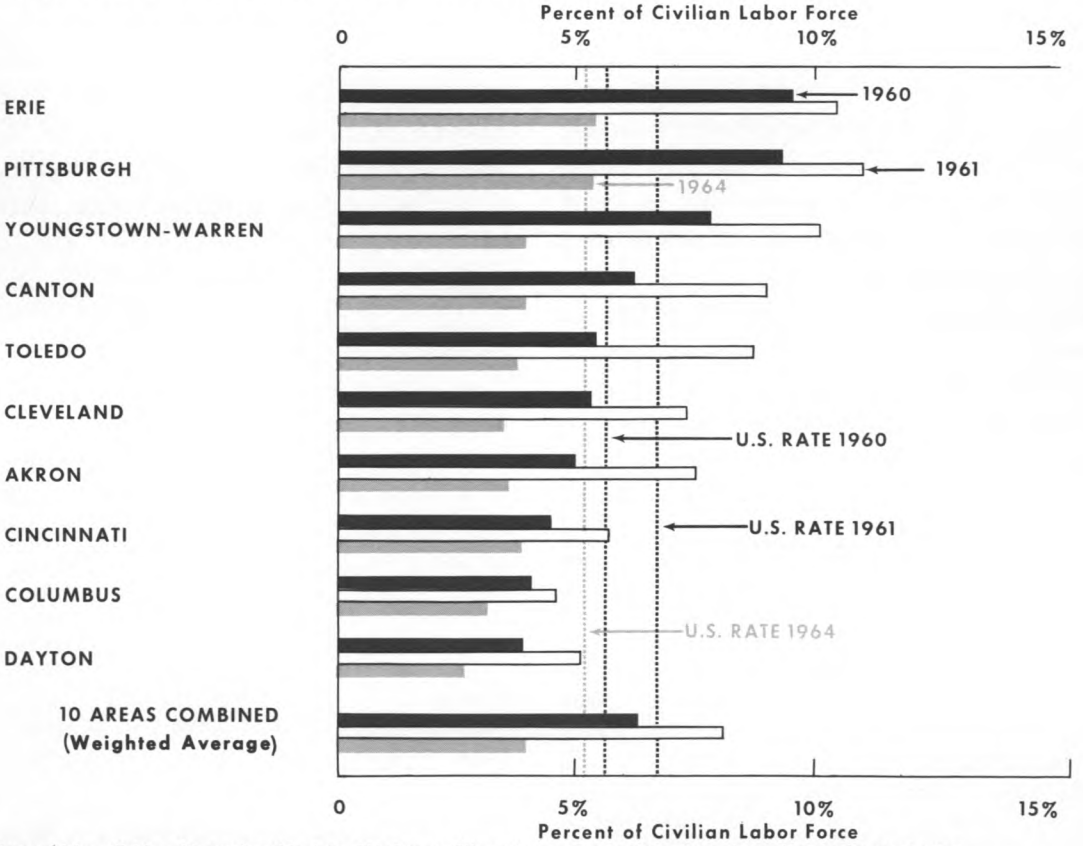
The article focuses on the ten largest metropolitan areas in the Fourth Federal Reserve District. Of the ten centers, eight are located in Ohio and two in Pennsylvania. Selection of the ten centers from almost twice that number of Standard Metropolitan Statistical Areas in the Fourth District was determined by size—a civilian labor force numbering at least 100,000 persons—and by availability of continuous and relevant data. As a group the ten areas share a degree of concentration of employment in the manufacturing industries, especially in durable goods, that exceeds the national average, while individually they show sufficiently broad variation in their industrial composition to account for different patterns of change.

MARKED DECLINE IN UNEMPLOYMENT

Chart 1 shows unemployment rates for each of the ten areas and for the U. S. in annual averages, for 1960, 1961 and 1964. The years chosen represent the latest prerecession peak, the trough of the recession, and the peak of the recovery thus far.

As one might expect, the rates for 1964 in all ten areas and in the U. S. were well below the high levels of unemployment in 1961. However, while the national rate declined by less than one-fourth from 1961 to 1964 (from 6.7 percent in 1961 to 5.2 percent in 1964), the rates in all of the ten areas of the District were reduced by a larger proportion and were cut in half in six areas. A sharp drop in unemployment during the recovery phase, following a sharp rise during the downturn of the economy, is not unusual, as a wide cyclical swing in the unemployment rate is characteristic of labor markets with a high concentration of employment in durable goods manufacturing.

1.
ANNUAL RATES of UNEMPLOYMENT
in Selected Fourth District Areas and U.S., 1960, 1961 and 1964



Sources of data: Division of Research and Statistics, Ohio Bureau of Unemployment Compensation; Pennsylvania State Employment Service; U.S. Department of Labor

More surprising, perhaps, is the relative change in the rates as measured over the entire cycle, from 1960 to 1964. While the national unemployment rate between the two years declined by less than one-tenth, or from 5.6 percent to 5.2 percent of the labor force, the drop in area rates ranged up to almost one-half, with the steel centers scoring the largest reductions.[1] As a result, the weighted average of the area rates in 1964, 4.1 percent, was conspicuously below the national rate; in contrast, at 6.3 percent in 1960, it had been above the national rate. While six areas in 1960 had a lower rate of unemployment than the country as a whole, the number increased to eight in 1964.

There can be little doubt that last year's rise in activity in the steel industry favorably affected the level of unemployment in the steel centers and that the general improvement in the economic climate helped to bring down unemployment in other areas. However, before accepting last year's low area rates as conclusive evidence that a "full employment" level of unemployment has been achieved in Fourth District areas but not in the nation, it might be instructive to look behind some of the figures as well as at concurrent employment and labor force developments.

[1] In the steel centers—Pittsburgh, Canton, and Youngstown-Warren—where primary metals employment contributes from one-sixth to one-fourth of total employment in nonfarm industries, the average rate for 1960 had been comparatively high due to the onset of employment curtailments in steel and other metalworking industries several months prior to the general downturn of the economy in May of that year.

DECLINE IN UNEMPLOYMENT DESPITE LITTLE EMPLOYMENT GROWTH

Usually one can assume that a decline in unemployment means that jobless people have found work and the number of employed persons has increased correspondingly. Such was the case with the decline in the national rate: fewer people were unemployed in 1964 than in 1960 as more had found employment over the same period.

That, however, was not the pattern in most of the ten areas in the District. Although the unemployment rate declined in all areas, overall growth in employment occurred in only five of them, including two with almost negligible gains. In the remaining areas, including the steel centers, a drop in the unemployment rate was accompanied by a net employment loss ranging from 0.4 percent to 4.4 percent over the four-year period (see Table I).

TABLE I

Percent Changes in Employment and Civilian Labor Force
1960-64 for Selected Fourth District Areas and U. S.

	Employment	Labor Force
Columbus	+8.6%	+7.5%
Erie	+5.5	+1.0
Dayton	+5.0	+3.7
Akron	+0.7	—0.8
Cleveland	+0.6	—1.3
Toledo	—0.4	—2.1
Canton	—1.3	—3.5
Pittsburgh	—1.5	—5.6
Cincinnati	—3.0	—3.6
Youngstown-Warren	—4.4	—8.2
U. S.	+5.5	+5.1

Sources: Division of Research and Statistics, Ohio Bureau of Unemployment Compensation; Pennsylvania State Employment Service; U. S. Department of Labor

These developments imply a shrinkage in the labor force also, since the latter by definition is the sum of its "employed" and "unemployed" components, and any change in the size of the components must balance with changes in the total. The data in Table I indicate a labor force decline in seven of the areas, by amounts ranging from almost one percent to more than eight percent over the four years, while an expansion of the labor force occurred only in the three areas that showed a significant gain in employment. Mathematically, this combination of declining numbers for both employment and unemployment, and thus for the labor force, is readily understandable. In economic terms, however, the developments in the areas under review contrast so markedly with national developments and general expectations that they call for further examination.

SHRINKAGE OF LABOR FORCE

Decline in the unemployment rate may not mean only that unemployed people are finding jobs; it may also mean just the opposite, namely, that they are failing to find jobs and for that reason quit actively looking for work, which disqualifies them as unemployed and removes them from the labor force. As the "discouraged worker" theory asserts, jobless workers, particularly those with only loose attachment to the labor force, such as young people and some married women, tend to withdraw from labor force participation at times when jobs are scarce and job hunting appears hopeless.[2] However, a situation where employment, unemployment, and the labor force go down at the same time, can arise only if all the people who lose their jobs, in addition to some who are already jobless, become discouraged and withdraw from the local labor force either by no longer looking for work or by moving to another area.

This appears to have happened in some of the areas during the early part of the four-year period, as Chart 2 reveals. The three areas in the right-hand portion of the chart show employment, unemployment, and the labor force moving in a "normal" or "healthy" relation to each other, a relation that is similar to their movement in the U. S. as a whole, which is plotted in the lower portion of the chart. In the areas in the left-hand portion of the chart, concurrent changes in the three categories lead to the conclusion that an exodus of discouraged workers from the labor force must have taken place. This may have been in the form of withdrawal from labor force participation or of outmigration, the latter being in effect a different type of withdrawal, that is, from the labor force of one area to that of another. Direct statistical evidence of outmigration for the period in question is not

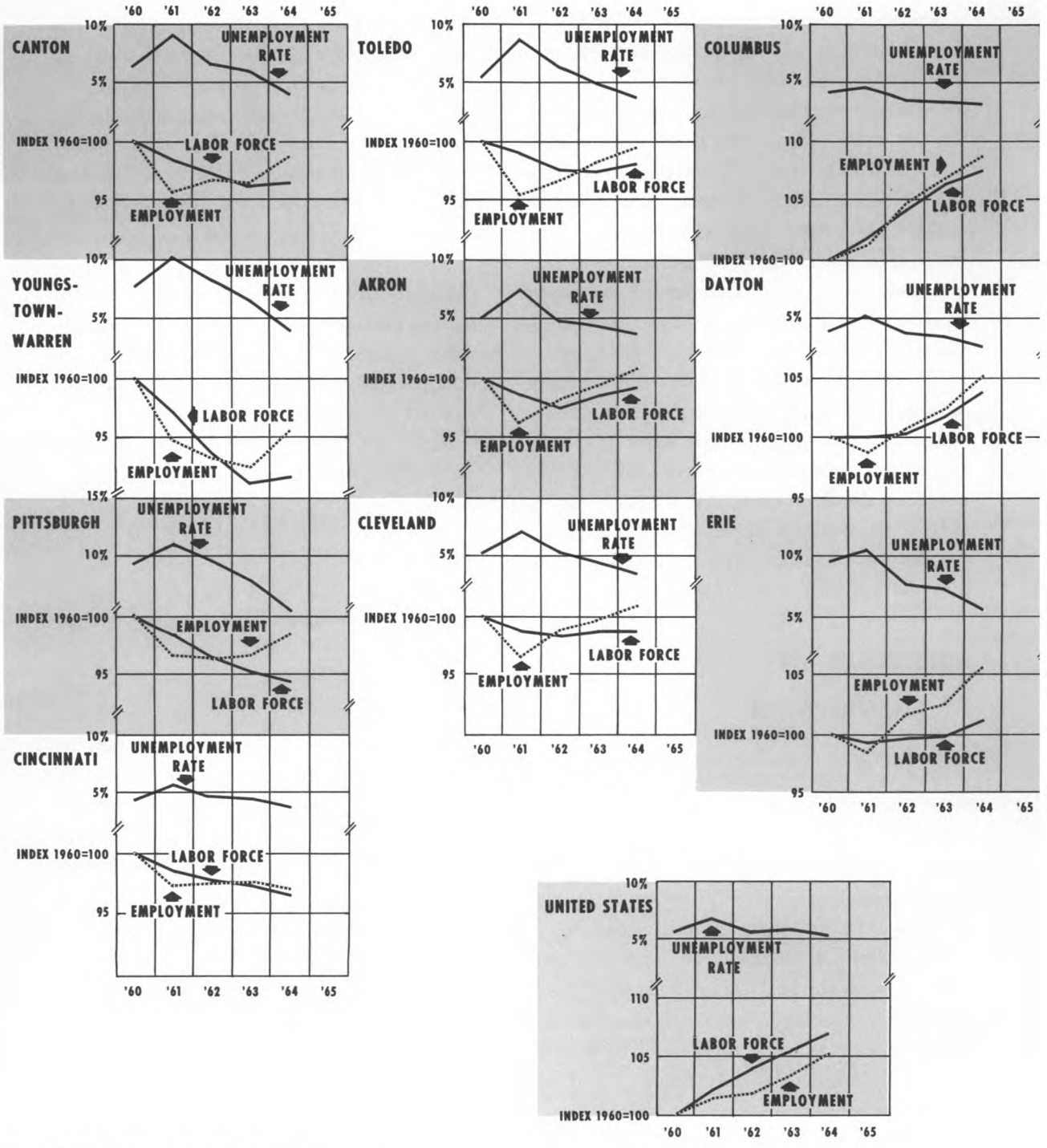
---

[2] This has been confirmed by such recent studies as Thomas Dernburg and Kenneth Strand's "Cyclical Variation in Civilian Labor Force Participation" in *Review of Economics and Statistics,* Harvard University Press, November 1964; or Alfred Tella's "The Relation of Labor Force to Employment" in *Industrial and Labor Relations Review,* Cornell University, April 1964, and "Labor Force Sensitivity to Employment by Age, Sex" in *Industrial Relations,* University of California (Berkeley), February 1965.

2.

CIVILIAN LABOR FORCE, EMPLOYMENT and RATE of UNEMPLOYMENT

Selected Fourth District Areas and U.S., Annual Averages 1960-1964



Sources of data: Division of Research and Statistics,
Ohio Bureau of Unemployment Compensation;
Pennsylvania State Employment Service;
U.S. Department of Labor

generally available. For the Pittsburgh metropolitan area a special census study of the nation's largest metropolitan areas showed a 1.6 percent reduction in population between April 1960 and mid-1963, which certainly was not due to natural causes but points to heavy outmigration.

During the latter part of the period from 1960 to 1964, with more encouraging employment prospects, the further decline in area unemployment rates—at a faster pace than in the nation as a whole—undoubtedly reflected primarily rising employment levels rather than outmigration and labor force withdrawal. To some extent it might also have been the result of the different methods by which national and subnational labor force data are obtained,[3] methods which are capable of producing different estimates.[4] For example, the U. S. Bureau of Employment Security regularly publishes labor force data for 150 major labor market areas in the country, covering about two-thirds of the nation's labor force and including the ten areas discussed in this article. The average rate of unemployment in those 150 areas from 1960 to 1964, while closely following the ups and downs in the national (household survey) rate, was consistently lower than the national rate. In 1960 and 1961 the difference averaged about two-tenths of one percentage point. In 1963 and 1964 the gap had widened to five-tenths of one point, which suggests that the two estimating techniques are not equally sensitive to some change that may have occurred in the composition of the unemployed.

INEXPERIENCED UNEMPLOYED UNDERESTIMATED?

An occupational breakdown of the unemployment totals from the household survey shows that in 1964 an average of 16 percent of the unemployed were persons without previous work experience—predominantly young people—as against only 11 percent in 1960. It seems plausible that the growing proportion of inexperienced jobseekers is not fully reflected in the area unemployment estimates since those estimates are based upon the number of "insured" unemployed, which excludes persons without previous employment. Likewise, persons reentering the labor force without employment would be excluded from the insured unemployment count and might not be fully estimated. The possibility that current area estimates somewhat understate the degree of unemployment by national standards should, therefore, be kept in mind when national and local unem-

[3] Nationwide estimates originate from a monthly survey conducted by the Bureau of the Census by means of a carefully selected sample of households across the nation. State and local area estimates, on the other hand, are prepared by state agencies following a uniform procedure of building up estimates of employment and of unemployment from components that are partly known and partly estimated.

[4] Discussion of the differences may be found, for example, in Chapter VII of *Measuring Employment and Unemployment* (Report of the President's Committee to Appraise Employment and Unemployment Statistics, 1962) or in Joseph C. Ullman's article "How Accurate are Estimates of State and Local Unemployment?" in *Industrial and Labor Relations Review*, Cornell University, April 1963, where BES unemployment estimates for April 1960 are compared with data from the 1960 Census of Population.

ployment rates are under comparison.[5]

An underestimated unemployment figure would, of course, also understate the size of the labor force. The numbers involved, however, are too small in proportion to the total labor force size to explain why the labor force in seven of the areas in the Fourth District failed to show any growth between 1960 and 1964, even though the national labor force expanded by 5 percent and the population over 14 years of age by 7 percent during the same period.[6] The explanation, rather, must be looked for in the amount of growth that occurred, or failed to occur, in employment.

Estimates of total employment in the areas are obtained by adding estimates of the self-employed, unpaid family helpers, domestic service workers, and farm workers to the number of wage and salary employees in nonfarm industries. The latter is by far the largest among the several components of total area employment and also the one most easily obtainable and most likely to be reliable, as well as comparable to its national counterpart. Changes in the size of nonfarm wage and salary employment will explain a large portion of the changes in total employment and the labor force of the areas.[7]

STRUCTURAL CAUSES OF DEFICIENT GROWTH

From Chart 3 it is evident that between 1960 and 1964 the growth of nonfarm payroll employment in only three of the ten areas —Columbus, Dayton and Erie—kept pace with the national growth.[8] In three other areas virtually no net change in employment occurred, while in the remaining four, including the three major steel centers, the number of nonfarm jobs in 1964 was lower than in 1960.

One might suspect that differences in the industrial structure of the areas as compared with that of the country as a whole account for

[5] Recent changes in the ratio between the national rates of total unemployment and of insured unemployment lend support to the view that the method of estimating total unemployment based upon insured unemployment may result in underestimating. That ratio, derived from annual averages of the two rates, has fluctuated between 1.11 and 1.29 over the period from 1954 to 1962. In 1963 and 1964 it stood at 1.33 and 1.39, respectively. A high ratio signifies a large proportion of unemployed persons who are not, or no longer, covered by unemployment compensation.

[6] A recent census estimate pegs the Ohio population 18 years and older for mid-1964 at 6,333,000, or 2.2 percent above the count of 6,198,000 in April 1960. The average labor force for 1964 as estimated by the Division of Research and Statistics of the Ohio Bureau of Unemployment Compensation, however, was 1.1 percent below the estimate for 1960. A ten-year labor force projection had shown an anticipated average growth of 2.3 percent per year from 1960 to 1970.

[7] The proportion of nonfarm wage and salary employment in the total employment estimate ranges from 85 to 90 percent in the areas as compared with about 80 percent in the national figure. These percentages have been growing larger during the last four years, both in the national figure and in most of the area data. The wage and salary employment estimates are subject to annual benchmark revisions while new census data are required to check the estimates of the self-employed and other components.

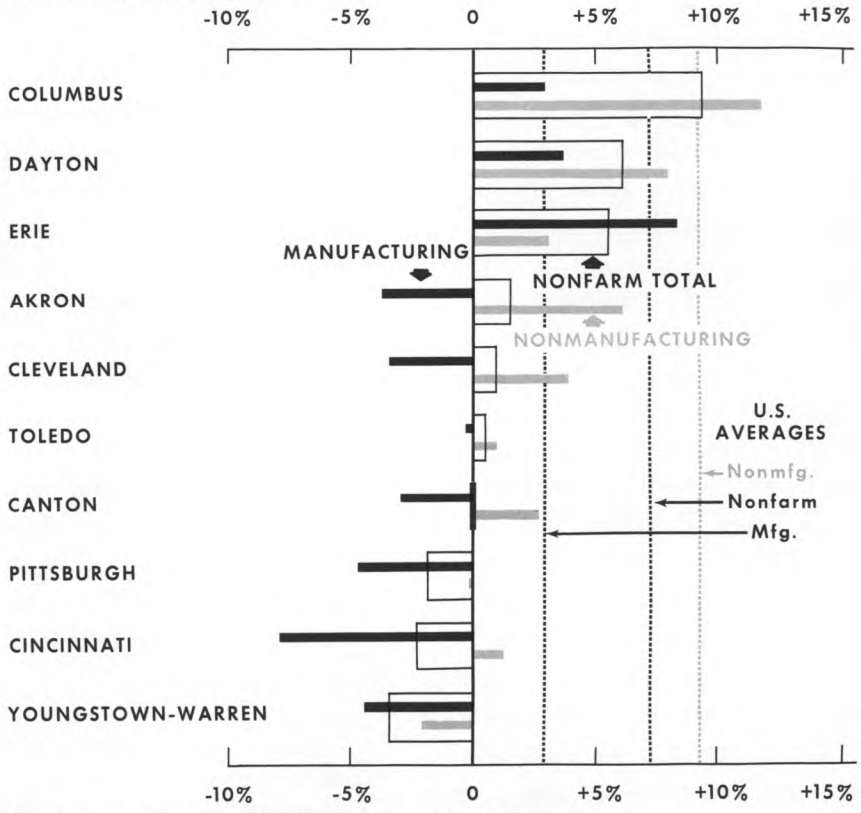
[8] Despite the high employment gain, the Erie area had been classified as an area of substantial unemployment during most of the period in question. This apparent contradiction stems from rather large employment losses in the late 1950's, including the transfer of a large plant manufacturing electrical equipment to another area, which resulted in a high level of unemployment and a relatively low base for measuring the rise in employment from 1960 to 1964.

the slow growth, or lack of growth, in the areas. Except for Columbus, all areas have more than 30 percent—the national average—of their nonfarm wage and salary jobs in manufacturing industries. Nationwide employment in the manufacturing sector expanded by only 3 percent between 1960 and 1964 in contrast to the 9-percent growth in nonmanufacturing industries, which reflects the increasing demand for services as well as the effects of technical advancement upon manpower needs in the production of goods. Consequently, areas with a large proportion of employment in the slow-growing manufacturing sector, such as most of the areas in the Fourth District, could be expected to show less than average growth in total nonfarm employment, while areas like Columbus would benefit from a high proportion of faster-growing nonmanufacturing industries. As shown in Chart 3, the manufacturing industries held back the growth of all-industry employment in some of the areas. This was due not only to their greater weight but also

3.

PERCENT CHANGES in NONFARM WAGE and SALARY EMPLOYMENT

Selected Fourth District Areas, 1960-1964



Sources of data: Division of Research and Statistics, Ohio Bureau of Unemployment Compensation; Pennsylvania State Employment Service; U.S. Department of Labor

to the failure to match even the modest 3 percent nationwide gain. In fact, seven areas suffered a loss in manufacturing employment over the four years, which acted as a further drag on the overall employment situation in those areas.

Here, too, one might suspect that differences in industry mix within the manufacturing sector were accountable for the lagging growth in the areas as compared with the whole country. Such differences do exist. For example, the five major metalworking industries—primary metals, fabricated metal products, machinery, electrical equipment, transportation equipment—contribute rather heavily to total employment in all of the areas except Akron. Their combined share of nonfarm wage and salary employment ranges from 16 percent to 40 percent in the other nine areas, in contrast to a nationwide share of only 13 percent (see Table II). On the basis of national performance, three of the five industries—machinery, fabricated metal products, and electrical equipment—can be considered as "growth" industries; primary metals, on the other hand, has been an industry with declining manpower needs, at least prior to its recent and probably unsustainable spurt of activity. Yet the four-year performance of the three "growth" industries in the ten areas, as Table III shows, does not on balance match the national record. Where gains did occur, they were for the most part of smaller proportions than the national average, except in the machinery industry, while losses in the primary metals industry exceeded the nationwide percentage. For the ten areas combined, the changes in each of the industries compared unfavorably with the national average.

This conclusion is confirmed by the data in Table IV, where the total amount of change in the combined areas is broken down for each important industry by the causes to which the change can be attributed: overall nationwide growth, industry mix, or difference between the national and the local rate of change for individual industries.[9] While column 3 shows the actual change that did occur over the four years, column 4 states the potential amount of change that would have resulted if the overall national growth rate had prevailed locally in all industries. The difference between the potential and the actual change appears in column 7 while the remaining two columns (5 and 6) indicate how much of the difference was due to favorable or unfavorable industry mix or to faster or slower industry growth in the areas as compared with the nation. For example, instead of achieving a potential gain of 88,800 jobs in manufacturing, the ten areas fell short by 127,900, that is, they actually suffered a loss of 39,100 jobs. Two-fifths (52,400) of the shortfall was due to unfavorable industry mix and three-fifths (75,500) resulted from industries in the areas failing to duplicate the national growth rates. The uniformly negative values in column 6 confirm the observation that area growth rates were below national rates in all major industries. Similar tables for individual areas, which are not shown here, point to the conclusions previously suggested by visual inspection of the data.

---

[9] A description of the method used is found in Lowell D. Ashby's article "The Geographical Redistribution of Employment: An Examination of the Elements of Change", *Survey of Current Business*, U. S. Department of Commerce, October 1964.

TABLE II

Employment in 5 Major Metalworking Industries as Percent of Nonfarm Wage and Salary Employment—1960

Selected Fourth District Areas and U. S.

	Primary Metals	Fabricated Metals	Machinery	Electrical Equipment	Transportation Equipment	Total, 5 Industries
Akron	0.4%	7.1%	3.1%	0.2%	0.1%	10.9%
Canton	17.0	7.1	10.3	2.2	0.4	37.0
Cincinnati	1.5	3.2	4.9	2.4	6.5	18.5
Cleveland	5.9	5.9	6.3	3.6	5.8	27.5
Columbus	1.0	3.4	3.7	3.8	4.0	15.9
Dayton	0.9	1.0	11.0	10.2	3.2	26.3
Toledo	2.8	3.7	4.2	1.7	8.3	20.7
Youngstown-Warren	27.3	4.4	2.9	2.5	2.4	39.5
Erie	5.3	6.1	11.7	5.7	*	28.8
Pittsburgh	16.8	3.7	2.4	3.8	0.9	27.6
U. S.	2.3	2.1	2.7	2.7	2.9	12.7

*Included with Machinery.

Sources: Division of Research and Statistics, Ohio Bureau of Unemployment Compensation; Pennsylvania State Employment Service; U. S. Department of Labor

TABLE III

Percent Changes in Nonfarm Wage and Salary Employment

1960-64* for Selected Industries in Selected Fourth District Areas and U. S.

	5 Major Metalworking Industries							
	Primary Metals	Fabricated Metals	Machinery	Electrical Equipment	Transportation Equipment	All Manufacturing	Nonmanufacturing	All Nonfarm Industries
Akron	a	+ 2.4%	+40.0%	a	a	—3.7%	+ 6.2%	+1.6%
Canton	— 2.9%	—21.5	— 7.0c	— 8.3%	a	—2.9	+ 2.9	0
Cincinnati	—12.7	— 6.2	— 3.5	—16.7	—12.3%	—7.9	+ 1.3	—2.2
Cleveland	— 7.2	+ 2.9	— 3.0	— 1.0	— 9.0	—3.4	+ 4.0	+1.0
Columbus	a	— 4.7	—12.6	+23.2	+37.0	+3.0	+11.9	+9.4
Dayton	a	a	+ 6.2	— 4.7	— 1.3	+3.8	+ 8.1	+6.2
Toledo	+ 6.7	+ 3.3	+ 8.8	—50.0c	+18.8	—0.3	+ 1.1	+0.5
Youngstown-Warren	— 4.9	— 6.8	+25.0	—11.9	+12.8	—4.4	— 2.0	—3.3
Erie	— 4.1	+ 4.3	+10.0	+18.2	b	+8.4	+ 3.2	+5.6
Pittsburgh	— 5.3	—11.8	+11.5	— 0.7	—10.3	—4.7	0	—1.8
Average—10 areas	— 5.3	— 3.8	+ 3.9	— 0.7	— 4.7	—3.2	+ 3.0	+0.5
U. S.	— 0.3	+ 5.4	+ 8.9	+ 5.6	+ 2.3	+3.0	+ 9.3	+7.3

* Data adjusted for major work stoppages.
a Employment insignificant.
b Included with Machinery.
c Estimated.

Sources: Division of Research and Statistics, Ohio Bureau of Unemployment Compensation; Pennsylvania State Employment Service; U. S. Department of Labor

TABLE IV

Components of Change in Nonfarm Wage and Salary Employment

1960-64 Combined Totals for Ten Selected Fourth District Areas
(Thousands of persons)

	Employment		Actual Change	Change due to			Net Difference
	1960	1964	1960-64	National Growth	Industry Mix	Area Share	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
All Nonfarm Industries	3,073.2	3,088.9	+15.7	+224.4	0	—208.7	—208.7
Nonmanufacturing	1,857.1	1,911.9	+54.8	+135.6	+37.1	—117.9	— 80.8
Manufacturing	1,216.1	1,177.0	—39.1	+ 88.8	—52.4	— 75.5	—127.9
Primary Metals	251.3	238.0	—13.3	+ 18.3	—19.0	— 12.6	— 31.6
Fabricated Metals	130.4	125.5	— 4.9	+ 9.5	— 2.4	— 12.0	— 14.4
Machinery	145.6	151.3	+ 5.7	+ 10.6	+ 2.3	— 7.2	— 4.9
Electrical Equipment	110.5	109.7	— 0.8	+ 8.1	+ 0.2	— 9.1	— 8.9
Transportation Equipment	98.9	94.2	— 4.7	+ 7.2	— 4.9	— 7.0	— 11.9

Sources: Division of Research and Statistics, Ohio Bureau of Unemployment Compensation; Pennsylvania State Employment Service; U. S. Department of Labor

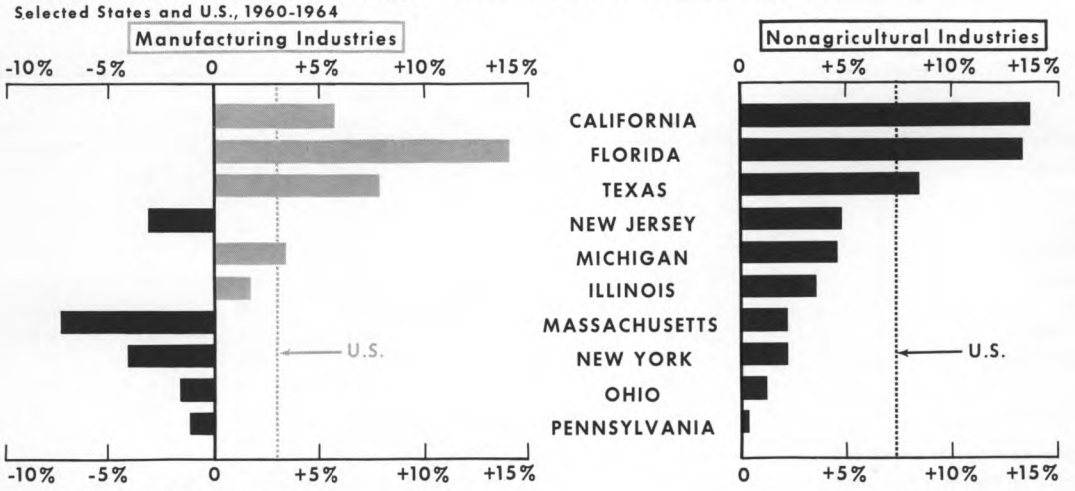
A closer look at more narrowly defined product groups within each of the five metalworking industries might yet uncover the reason for the below-average performance in the areas of low growth. For example, the nationwide employment decline of 0.3 percent between 1960 and 1964 in the primary metals industry (SIC 33)—see Table III—covers both a loss of 4.1 percent in basic steel (SIC 331) and offsetting gains in the foundries and in the nonferrous sectors of the industry group. Basic steel contributes just over 50 percent to total primary metals employment in the nation, as compared with, for example, over 80 percent in Youngstown-Warren and 65 percent in Canton. While this helps explain the heavier-than-average loss in primary metals employment in those two areas, it leaves unexplained the fact that in basic steel alone, employment again declined more heavily in the areas than in the nation. In the electrical equipment industry (SIC 36) a similar analysis of employment gains and losses—as far as available data permit—suggests that some of the areas may contain a larger share of the lagging components and a smaller proportion of the expanding components of that industry than the nation as a whole, but again these differences alone do not account for the industry's deficient employment growth in the areas.

The nonmanufacturing industries at first glance present a brighter picture of employment growth in the areas than does the manufacturing sector due to the fact that employment losses during the recession were minimized and gains during the recovery were stimulated by the shift in production from goods to services. As Chart 3 shows, all except two of the areas advanced beyond the level of nonmanufacturing employment that prevailed in 1960. Yet even here the gain in

4.

PERCENT CHANGES in WAGE and SALARY EMPLOYMENT

Selected States and U.S., 1960-1964



Source of data: U.S. Department of Labor

six of the areas was below the national rate of gain.[10]

GEOGRAPHIC SHIFTS IN EMPLOYMENT

In view of the slender gains in employment in the major areas in the Fourth District, the conclusion seems inescapable that the bulk of the reported nationwide increase during the past several years has occurred elsewhere. From census reports it is known that a geographical shift in the population toward the western and southern regions of the country has been in progress for over a decade. It appears that a similar shift in employment has accompanied, or perhaps precipitated, that movement of people, and has brought about a rather disproportionate sharing of recent national gains in employment as well as in population among the states. For example, California, Texas and Florida, with a combined population of 17 percent of the total U. S. population in 1960, absorbed 36 percent of the increase in the country's total population 18 years and older between April 1960 and July 1964, according to the most recent Census Bureau estimates. In contrast, Ohio and Pennsylvania, which contributed not quite 12 percent to the U. S. population in 1960, received 2.4 percent of the four-year growth. Of the nation's four-year gain in nonfarm wage and salary jobs, the three growth states claimed 27 percent, or almost twice their proportionate share based on 1960 employment. Ohio and Pennsylvania took 1.5 percent of the gain despite a 12.7 percent share in the country's employment total in 1960. And finally, while Ohio and Pennsylvania had a net loss in manufacturing jobs from 1960 to 1964, the three states in the

[10] The pace of employment rise, in both the manufacturing and the nonmanufacturing sectors, has quickened during the second half of 1964 in most of the areas to cause employment levels in some of the lagging areas to come closer to, or even exceed, the levels of 1960.

TABLE V

Employment and Population in Selected States as Percent of U. S. Totals, 1950, 1960 and 1964[a]

	Wage and Salary Employment						Population		
	Nonfarm Industries			Manufacturing Industries					
	1950	1960	1964	1950	1960	1964	1950[b]	1960[b]	1964[c]
California	7.1%	9.0%	9.6%	5.0%	7.8%	8.1%	7.3%	9.0%	9.6%
Florida	1.6	2.4	2.6	0.7	1.2	1.4	1.9	2.9	3.1
Texas	4.2	4.7	4.7	2.4	2.9	3.1	5.0	5.3	5.3
New Jersey	3.7	3.7	3.6	5.0	4.8	4.5	3.4	3.5	3.6
Michigan	4.8	4.3	4.2	7.0	5.8	5.8	4.2	4.3	4.1
Illinois	7.0	6.5	6.3	7.9	7.2	7.1	6.0	5.8	5.6
New York	12.3	11.4	10.9	12.6	11.2	10.4	10.5	10.0	9.9
Massachusetts	3.9	3.5	3.4	4.7	4.2	3.7	3.3	3.0	2.9
Ohio	6.1	5.8	5.5	8.0	7.5	7.2	5.4	5.4	5.2
Pennsylvania	8.1	6.9	6.4	9.7	8.6	8.2	7.1	6.6	6.2

a Employment figures based upon annual averages for 1950, 1960 and 1964.
Population figures based upon Census of Population returns for 1950 and 1960 and upon estimates for July 1, 1964.

b 14 years and over.

c 18 years and over.

Sources: U. S. Department of Labor; U. S. Department of Commerce

West and South took almost 29 percent of the four-year increase in jobs in the manufacturing industries.

The employment gains of states such as California, Texas and Florida have not been solely at the expense of Ohio and Pennsylvania—as Chart 4 indicates—nor did they occur only during the past several years. Comparable percentages of growth during 1950-60, which are not shown in the chart, confirm the conclusion that the leading position of the traditional manufacturing centers in the eastern and Great Lakes regions has been facing a serious challenge for some time. The gradual shift in employment away from the former leaders shows up clearly in the percent distribution of total U. S. employment among major states for 1950, 1960 and 1964, as presented in Table V.

Numerous factors have contributed to the movement of people and jobs to the West and South. Among them are the advantages of climate, the shift away from manufacturing and greater emphasis on services—particularly recreational activities—the location of the nation's defense industries and space research centers, or the desire, especially of research-oriented industries, to be near existing research facilities and sources of research talent.

Long-range projections by the U. S. Bureau of the Census, indicating that the shift of the population from the Great Lakes and other regions toward states in the west and southwest of the country will continue during the next two decades, suggest that the movement of employment opportunities in the same direction may likewise be expected to go on.

RECENT TRENDS IN THE WOOD-USING INDUSTRIES

The usage of timber in the U. S. has undergone profound changes over the years, a change process that has quickened in the postwar period. These changes are the result of two basic and related factors: first, the long-term decline in the nation's supply of choice timber; and second, the development through extensive research of new products, such as plywood, which are made from wood fibers.

In some of its modern forms—flush doors made of plywood, for example—the new timber product is essentially a replacement for a former product—panel doors in this instance. In other cases—such as rayon—timber usage has moved into fabrics, an entirely new market. At the same time, certain historic uses of timber—fuelwood, for example—are well on the way to becoming obsolete. Despite these shifts in usage, however, the total consumption of timber products during the past decade has held within a relatively narrow range, varying only from a high of 12.5 billion cubic feet in 1956 to a low of 11.2 billion cubic feet in 1958. Consumption in 1964, at 12.4 billion cubic feet, was just short of the long-time high of 1956.

The significant developments in timber usage during recent years, therefore, do not involve growth in total volume, but rather, the substantial shifts in product form that have been made possible by innovations and extensive refinements in the manufacturing and marketing end of the timber industry as a whole. This is highlighted in Chart 1. *Plywood and veneer logs* and *pulpwood*, the two product groups requiring the most extensive processing, are the two groups that have shown the most growth in consumption. In contrast, the volume of *sawlogs*, which involve less processing, has held relatively stable. The fourth product group, a catch-all category called "*other timber products*", is made up mostly of relatively crude items,

and the proportion of these products in the total volume of timber consumption has declined markedly. Highlights of usage trends in each of the four product groups are now discussed in turn.

PLYWOOD AND VENEER

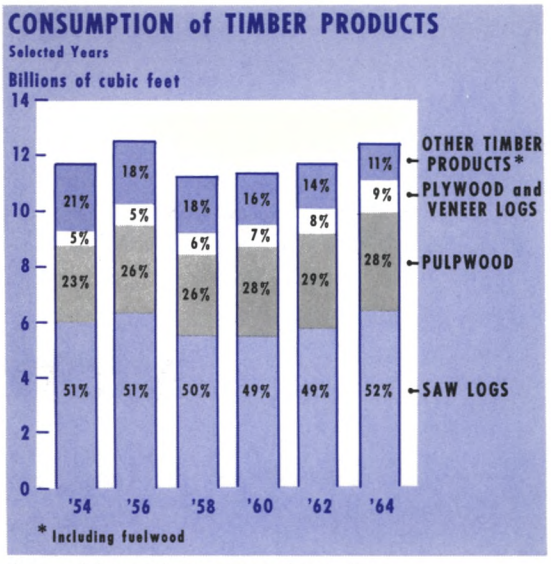
Construction is the major end use for plywood and veneer. Estimated plywood and veneer consumption in 1964 was 14.5 billion square feet (3/8 inch basis), or 11 percent more than in 1963 and 2½ times as much as in 1954.[1] Softwood plywood, which accounts for about four-fifths of total plywood output, is highly favored as a construction material because of its relatively low cost and the ease with which it can be used to cover large areas rapidly and effectively. Major fabricated forms of softwood plywood include sheathing material for walls, roofs, and subfloors of residential and commercial buildings. It is also used for partitioning, shelving, concrete forms, and shipping cases.

Hardwood plywood, used extensively in the furniture industry, is also used in the manufacture of flush doors, which have largely replaced panel doors. Other fabricated forms of hardwood plywood include mobile homes, paneling in homes and offices, and manufactured products such as sporting goods and toys. Consumption of hardwood plywood and veneer in 1964 was about 1½ times the volume of a decade earlier.

PULPWOOD

Pulpwood is used in the manufacture of paper, paperboard, and nonpaper products such as rayon and cellophane made from wood pulp. Consumption of pulpwood from domestic sources approximated 49 million cords in 1964, or 6 percent more than in the previous year and about two-thirds more than ten years earlier. Over the past ten years, pulpwood consumption has been increasing at an average annual rate of 5.2 percent. If net imports of paper, paperboard, and wood pulp are included, total pulpwood consumption in 1964 was equivalent to about 57 million cords.

1.



Source of data: U.S. Department of Agriculture

Generally speaking, two developments are mainly responsible for the marked expansion in the use of veneer and plywood, pulpwood, and other products based on wood fiber. The first is the shrinkage in the available supply of high-quality saw timber at prices that are competitive with other materials. Such depletion has stimulated the search for ways to utilize timber of lower quality. These efforts have been fruitful, and have led to the second

[1] Estimates of total consumption are made by converting various quantity measures into cubic feet.

development, namely, the fact that special qualities have been built into wood fiber products that allow them to compete effectively with lumber under many circumstances. The broadened market for such processed materials has contributed significantly to the stability of operations in the wood-using industries.

SAWLOGS

Preliminary estimates indicate that 41.3 billion board feet of lumber were consumed in 1964, or approximately the same proportion of total consumption as ten years earlier. About three-fourths of all lumber produced is used for construction. The remainder is about equally divided between manufactured products and materials used in shipping. Although a gradual rise in demand for lumber used in construction is anticipated by forest economists[2] over the next 10 to 15 years, most projections assume some further displacement of lumber by plywood, building board, and particle board. The latter product, which is made by pressing dried wood chips and flakes with resin under controlled heat, has won wide acceptance in home construction and in the furniture industry.

The demand for lumber for manufactured products is also expected to rise, reflecting mainly an expansion in the production of household furniture. Some decline in the consumption of lumber for wooden containers is anticipated because of competition from container board, but this decline may be more than offset by a significant expansion in the use of pallets and blocking used extensively in the shipment of industrial products and equipment.

[2] *Demand & Price Situation for Forest Products, 1964,* U. S. Department of Agriculture, Publication 983.

OTHER TIMBER PRODUCTS

Consumption of "other timber products", also shown in Chart 1, dropped from about one-fifth to one-tenth of the total in the past decade. Products in this category include cooperage logs, poles and piling, fence posts, hewn railroad ties, round mine timbers, box, excelsior and shingle bolts, chemical wood, miscellaneous items, and fuelwood.

PRODUCTION OF WOOD-USING INDUSTRIES

Industries based on the use of wood constitute one of the eight major manufacturing groups in the U. S. The relative standing of the wood-using industries can be measured in a number of ways. For one thing, during 1963, the latest year for which figures are available, employment of more than one and a half million persons in the wood-using industry was exceeded only by the food and the transportation equipment industries, as shown in Table I. During the same year, aggregate value added by manufacture of the wood-using industries was $14.6 billion, for a ranking of sixth among the eight major manufacturing groups. In new capital expenditures in 1963, the wood-using industries were among the top three industry groups—a position which they have occupied during most of the past decade.

The major wood-manufacturing industries include the lumber and wood products industry, the furniture and fixtures industry, and

TABLE I

A Comparison of Wood-Using Industries with other Manufacturing Groups—1963
(In Millions)

Value Added		Employment		Capital Expenditures	
Transportation Equip.	$22,620	Food & Kindred Prod.	1.64	Primary Metals	$1,362
Food & Kindred Prod.	21,364	Transportation Equip.	1.62	Food & Kindred Prod.	1,249
Machinery	16,897	Wood-Using Industries	1.57	Wood-Using Industries	1,141
Electrical Machinery	16,333	Electrical Machinery	1.47	Transportation Equip.	1,049
Primary Metals	15,249	Machinery	1.46	Machinery	775
Wood-Using Industries	14,593	Apparel	1.30	Electrical Machinery	685
Fabricated Metals	11,865	Primary Metals	1.12	Fabricated Metals	608
Apparel	7,792	Fabricated Metals	1.10	Apparel	143

Source: 1963 Census of Manufactures, U. S. Department of Commerce

the paper and allied products industry.[3] As shown in the upper panel of Chart 2, the output of these industries, taken together, has closely paralleled that of total industrial production over the past decade, except in 1957 when lumber consumption dropped sharply in response to a decline in housing starts. Output of the three wood-using industries as a group has increased by about 50 percent over the past decade, a gain similar to that of total industrial production. Among themselves, however, the three wood-using industries have displayed different growth patterns, especially in recent years.

FURNITURE AND FIXTURES

After furniture and fixture output reacted to a strong year in housing starts in 1955, production of the three wood-using industries followed similar patterns until 1959. Beginning in that year, production of furniture and fixtures again moved up sharply and has remained well above that of paper and allied products except during the 1960-61 recession. Following the recession, the furniture and fixtures industry (which accounts for about one-fourth of the combined weight of the three industries in the industrial production index) recovered more rapidly and registered more growth than either the paper and allied products industry or total industrial production.

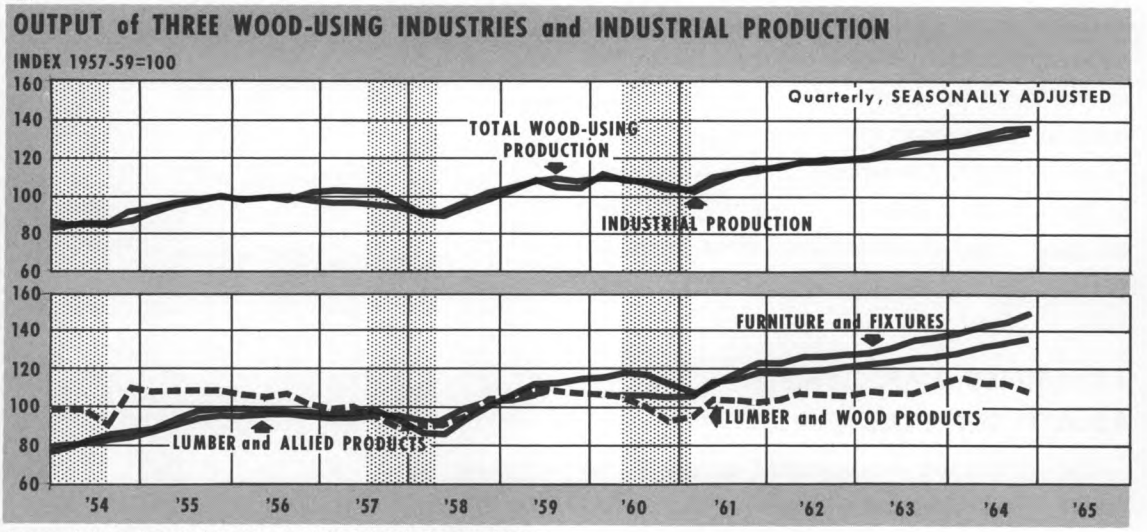
Marked expansion in production of furniture and fixtures in recent years reflects continued increases in the nation's population, family formation, housing, and disposable personal income. It also reflects a stronger demand for "contract" furniture used in guest rooms of hotels and motels. The number of guest rooms in hotels and motels is reported to have increased by one-third in the past seven years.

LUMBER AND WOOD PRODUCTS

Production of lumber and wood products pretty much kept pace with the other wood-using industries through 1959. Since that time, however, in contrast to the growth

[3] It should be pointed out that nonwood products of the furniture and fixtures industry account for about 40 percent of value added and 35 percent of the employees of the industry.

2.



Source of data: Board of Governors of the Federal Reserve System

registered by the other groups, production of lumber and wood products (which also accounts for about one-fourth of the combined weight of the three wood-using industries) has recovered more slowly. In fact, it has experienced relatively little further expansion since regaining the pre-1960-61 recession level.

The limited recovery of the lumber and wood products industry reflects the influence of a number of developments. Lumber consumption is closely related to housing starts, particularly single-family dwellings. Thus, a sharp drop in residential construction pulled lumber consumption down from 40 billion board feet in 1959 to 35 billion in 1961 (see Chart 3). The recovery in total housing starts after 1961 stimulated lumber consumption somewhat, but the impact was blunted because the housing-start increase represented mainly an expansion of multiple-family units, as shown in the chart. Since brick and cement are more commonly used in the construction of multiple-family units, less lumber was required per unit than when single-family units represented a larger proportion of the housing starts. Starts of single-family units stabilized in 1960 and remained virtually unchanged thereafter.

Nevertheless, the increase in domestic lumber production still did not keep up with the moderate rise in consumption. While lumber consumption increased 15 percent from 1960 to 1964, domestic production rose only 12 percent. Imports, principally softwoods from Canada, filled the gap. Net imports, which had averaged less than 3 million board feet in most years prior to 1960, registered a 50-percent increase from 1960 to 1964, as shown in Chart 4. In the latter year, net imports were equal to 11 percent of domestic consumption, up from 8 percent in 1960.

PAPER AND ALLIED PRODUCTS

The paper and allied products industry is the largest of the three wood-using industries,

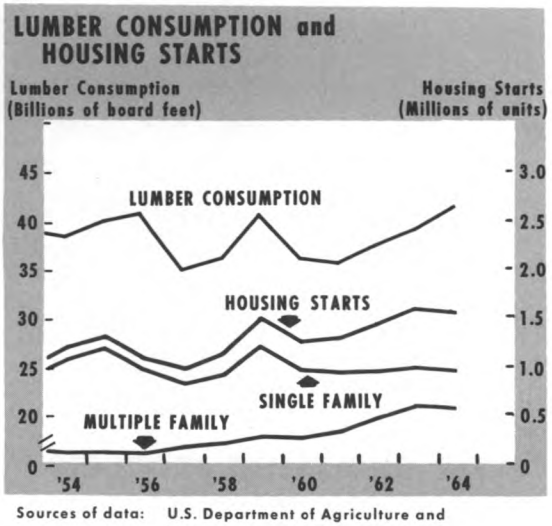
accounting for slightly over half of the combined weight of all three. Production in the paper group has grown at a pace close to that of industrial production throughout the past decade, reflecting the fact that paper and paper products are widely used in all sectors of the economy. In terms of cyclical behavior, the paper and allied products industry is the least volatile of the three wood-using industries.

COMBINED EMPLOYMENT RELATIVELY STABLE

The combined employment of the three major wood-using industries has held within a relatively narrow range around 1.6 million persons throughout the postwar period, as shown in Chart 5. Moderate increases in employment by furniture and fixtures manufacturers, together with significant gains in employment at paper and allied products plants, has offset reductions in the lumber and wood products industry. Employment of lumber and wood products manufacturers in 1963 represented 37 percent of total employment in the wood-using industries, as shown in the chart, down from 51 percent in 1947. Meanwhile, the number employed by paper and allied products industries rose from 28 percent to 39 percent of the total, while employment in furniture and fixtures increased from 20 percent to 24 percent.

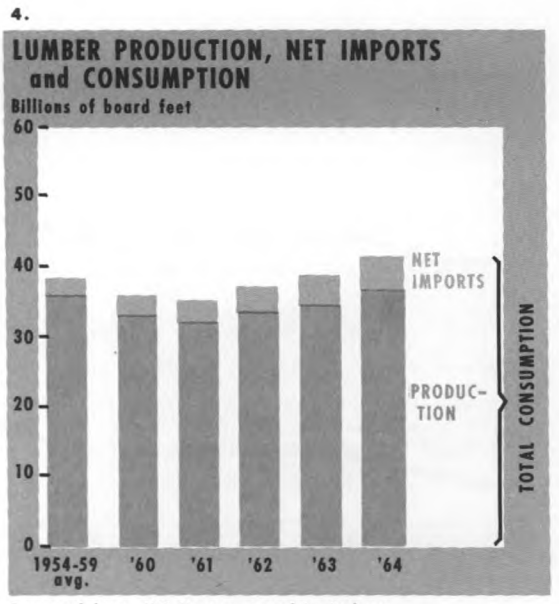
Recent changes in employment and output among the three wood-using industries reveal contrasting patterns. (See Table II.) While output in the lumber and wood products industry rose 9 percent from 1957-59 to 1963, employment declined about 9 percent, suggesting a marked increase in productivity for that industry. Output increased in the furniture and fixtures and paper and allied products industries even more strongly. Since employment increased only moderately, this suggests that gains in productivity also occurred in those industries.

3.



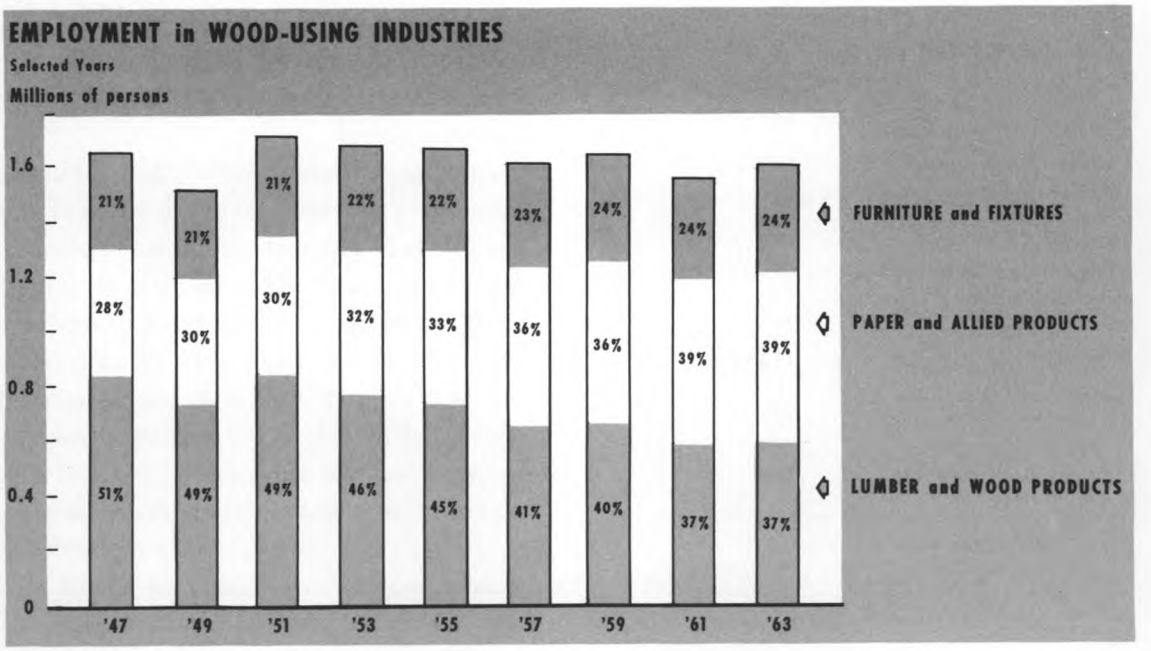
Sources of data: U.S. Department of Agriculture and U.S. Department of Commerce

4.



Source of data: U.S. Department of Agriculture

5.



Source of data: U.S. Department of Commerce

TABLE II

Changes in Employment and Output
1957-59 to 1963

	Employment	Output
Lumber & Wood Products . . .	—8.8%	+ 8.9%
Furniture & Fixtures	+4.4	+33.1
Paper & Allied Products	+8.1	+25.1
All Manufacturing Industries . .	—0.1	+24.9

Source: 1963 Census of Manufactures, U. S. Department of Commerce

MATERIAL COSTS AND WAGES

Of the many factors considered in selecting the location for a particular manufacturing enterprise, three usually receive high priority: accessibility of raw materials, material costs, and wages. To gain some insight into the relative importance of these factors in the wood-using industries as compared with a selection of other industries, average material costs and wage costs have been computed as a percent of the average value of shipments in 1961-62 (Table III).

Material costs for the wood-using industries do not represent as large a percent of the value of shipments as they do for some of the other major industries, but since material costs account for over 50 percent of the value of shipments, most wood-using industries tend to locate relatively near the major source of their raw material.

The distance that the raw material can be economically transported varies with the value of the raw material. Hardwood veneer logs, for example, may be transported seven to eight times the distance that hardwood

TABLE III

Material Costs and Wage Costs as a Percent of Value of Shipments
1961-62 Average

	Material Costs	Wage Costs
Food & Kindred Products	68.8%	12.9%
Transportation Equipment	59.6	22.5
Primary Metals	59.4	22.3
Apparel	57.8	26.6
Wood-Using Industries	55.0	24.2
Fabricated Metals	50.1	28.0
Electrical Machinery	44.6	31.1
Machinery	44.9	33.2
Three Major Wood-Using:		
Lumber & Products	57.8	25.9
Furniture & Fixtures	49.3	29.6
Paper & Allied Products	55.4	21.5

Source: 1962 Annual Survey of Manufactures, U. S. Department of Commerce

pulplogs would normally be transported because of the marked difference in value.

Within the wood-using industries, variations in material costs as a percent of the value of shipments reflect differences in the value of the respective end products due to the amount of value added in manufacture rather than to significantly different material costs per se. Thus, material costs represent a smaller part of the value of shipments in the furniture and fixtures industry, than in lumber and wood products, largely because furniture and fixtures generally represent an end product of higher value than lumber and wood products.

Unlike material costs, wage costs tend to run higher in industries with an end product of higher value, not necessarily because man-hour costs are greater but because more man-hours are needed. As a group, the wood-using industries are about at the midpoint of the range in wage costs for industries listed in Table III. The furniture and fixtures industry, however, ranked near the top in wage costs as a percent of value of shipments, while wage costs for the paper and allied products industry were among the lowest for the eight major industries listed.

Another variable factor that influences wage costs as a percent of the value of shipments is the amount of investment in plant and equipment. Relatively high plant and equipment expenditures by the wood-using industries, and by the paper and allied products industry in particular, may be assumed to have contributed to the comparatively low wage costs of that industry. In 1961 and 1962, plant and equipment expenditures as a percent of value of shipments were higher for the wood-using industries than for almost all of the major industry groups, as shown in Table IV.

TABLE IV

Plant and Equipment Expenditures of Wood-Using Industries Compared with Other Manufacturing Groups
1961 and 1962

	Plant and Equipment Expenditures as a Percent of Value of Shipments	
	1961	1962
Wood-Using Industries	3.60%	3.85%
Primary Metals	3.84	3.43
Machinery	2.55	2.53
Fabricated Metals	2.03	2.30
Electrical Machinery	2.51	2.30
Food & Kindred Products	1.61	1.88
Transportation Equipment	1.64	1.66
Apparel	0.53	0.61
Three Major Wood-Using:		
Paper & Allied Products	4.63	4.79
Lumber & Wood Products	3.01	3.48
Furniture & Fixtures	1.50	1.73

Source: 1962 Annual Survey of Manufactures, U. S. Department of Commerce

TABLE V

Proportion of New Capital Expenditures on Plant and Equipment Wood-Using Industries and all Manufacturing Industries

	Percent Distribution					
	1954		1958		1962	
	Structures	Equipment	Structures	Equipment	Structures	Equipment
Paper & Allied Products	24	76	22	78	19	81
Lumber & Wood Products	29	71	33	67	27	73
Furniture & Fixtures	37	63	38	62	47	53
All Manufacturing Industries	30	70	33	67	26	74

Sources: U. S. Census of Manufactures, 1958, Vol. I; 1962 Annual Survey of Manufactures, U. S. Department of Commerce

As shown in the lower part of Table IV, the paper and allied products industry has been a significant factor in the relatively high level of plant and equipment expenditures of the wood-using industries. As between plant *or* equipment, the paper industry has consistently spent a larger portion of new capital on new machinery and equipment than either of the other wood-using industries or manufacturing industries in general, as shown in Table V.

CONCLUDING COMMENTS

More than one-third of the land in the Fourth Federal Reserve District is forested, and wood-using industries are of some importance to the District economy. Against the background of the present article, a future one will discuss the current status and future prospects of timber resources and wood product manufacturing in the Fourth District.

Fourth Federal Reserve District