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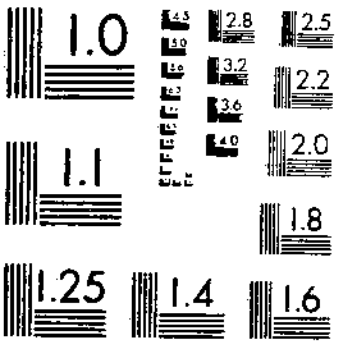
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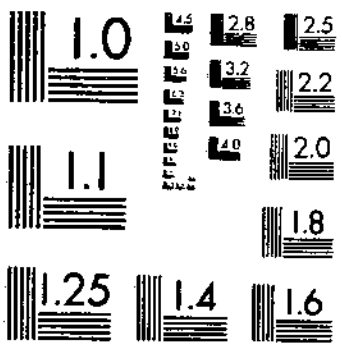
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Area Variations in the WAGES OF AGRICULTURAL LABOR in the United States

by
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PREFACE

With the increasing mechanization in agriculture, our farmers have produced more food and fiber with a steadily declining farm work force. Most work on farms is done by farmers and their families; about a third of the farm work force is composed of hired workers. As farm output rises to keep pace with our mushrooming population, the shrinking farm labor force becomes increasingly important to the national economy. Further, hired workers are concentrated on the larger and more productive farms and are critically needed during the harvest season. The farm wage structure and its geographic variations, therefore, are significant factors in the agricultural production process, and the hired worker and his family are an important segment of the rural community.

The extensive data on farm wages collected in the 1950 and 1954 Censuses of Agriculture made possible for the first time a detailed study of the geographic variation in farm wage rates. Through these data and related information from the Census of Population and other sources, the study reported in this bulletin was intended to broaden our knowledge of the farm labor market and the relationship between farm wage rates and other variables in the farm enterprise and rural life.

The study was conceived and planned by Louis J. Ducoff. It is, in part, a follow-up of an earlier farm wage study by Ducoff, published in 1945—Wages of Agricultural Labor in the United States, Technical Bulletin No. 895.

Most of the data used in this report are from the Census of Agriculture. The most comprehensive picture of the structure and geography of farm wage rates ever attempted in the United States was developed in the 1950 Census. The Censuses of Agriculture for 1950 and 1954 published extensive and carefully planned tabulations of data on hired farm labor and farm wage rates. These provided the basis for the present study. Acknowledgment is made to Ray Hurley, Chief of the Agriculture Division, Bureau of the Census, for his cooperation in the development of this project.

Gladys K. Bowles contributed to the planning of tabulations and the development of statistical procedures and reviewed the technical appendices.

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By Sheridan T. Maitland and Dorothy Anne Fisher
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HIGHLIGHTS

Hired workers on farms in the United States earned a cash wage equivalent to 52 cents an hour, exclusive of perquisites, in the spring of 1950. In the fall of 1954, farmers were paying an average of 79 cents an hour in cash. About half of this increase represents the temporary seasonal rise in farm wage rates each fall. The remaining half represents an increase in cash wage rates for farm workers during this period.

Farm employers in the Far West paid the highest average cash farm wages in 1950, those in the Southeast paid the lowest. Farmers in the East South Central States were paying an average of 34 cents an hour in cash in the spring of 1950 while West Coast farmers were paying a composite hourly rate of 85 cents. By the fall of 1954, the rates had risen to 54 cents and $1.03, respectively, in those areas.

In general, low farm wage rates were found where farm labor was overabundant and birth rates and rates of out-migration were high. Where high birth rates over an extended period of time have insured a supply of workers greater than the replacement needs of the local agricultural labor force, underemployment and unemployment have kept farm wage rates low even in the face of high out-migration.

On the labor demand side, lack of capital, small economic units, and limited mechanization were found to be associated with low farm wage rates in most areas.

Off-farm employment opportunities affected the level of farm wage rates significantly in all parts of the country. In areas of ample alternative employment opportunities, farm wages were relatively high. This relationship held even in areas of low farm income, limited mechanization, and high out-migration.

SUMMARY

In April 1950 hired farm workers in the United States were earning an average of 52 cents an hour in cash wages, exclusive of any perquisites. Regionally, farm wages varied between an average of 34 cents an hour in the East South Central States to 85 cents an hour in the Pacific Coast States. These figures are "composite hourly cash farm wage rates" based, in large part, on 1950 Census of Agriculture data and consist of the weighted average hourly equivalents

of monthly, weekly, daily, hourly and piece-rate wages paid hired workers throughout the country.[1] The causes of area variations in farm wages in 1950 were investigated in this study by means of correlation analysis between the 1950 hourly composite rate and various economic and demographic variables selected from the 1950 Census of Agriculture and Census of Population. Composite hourly cash farm wage rates also were computed for 1954 but the correlation analysis was not repeated for that year because some of the more important variables were available for 1950 only.

In the fall of 1954 the average hourly cash wage was 79 cents,[2] as compared to the average of 52 cents an hour in the spring of 1950. About half of the change between 1950 and 1954 can be attributed to seasonal variation. A wage rate for an April date, as quoted for 1950, more nearly reflects the cash payments to the regular, or more permanent, hired workers. On the other hand, a wage for September or October, as reported for 1954, gives more weight to the higher cash earnings of short-time harvest workers. There was a distinct geographic differential in the quoted wage rates for 1950 and 1954 which was due to seasonal variation in the numbers of workers in the various classes.

Regional Changes in the Farm Wage Picture, 1950–54

Because of the seasonal difference in reporting periods for the agricultural censuses, the substantial increases in rates between 1950 and 1954 are of less significance than the variations in regional changes. The East South Central States with the lowest farm wage rate in 1950 had a large percentage increase, while the Pacific States with the highest wage rate in 1950 had the lowest percentage increase. The Middle Atlantic States and the Mountain States also had relatively high wage levels and small rates of increase. In the remaining regions, however, the pattern varied. The East and West North Central States and New England had relatively high farm wage rates in 1950, but large percentage increases between 1950 and 1954. On the other hand, the South Atlantic States, which had a comparatively low wage level in 1950, experienced a relatively small percentage increase in farm wage rates. The West South Central States had a relatively low wage level in 1950 with a below average rate of increase in farm wages between 1950 and 1954.

Regional changes in the size and shape of graduated farm wage rate belts and islands are shown on the maps on pages 14, 15, and 16. Isometric wage belts based on the 1950 and 1954 censuses can be compared with farm wage belts for 1943, developed in a comprehensive study of agricultural wages [3] based on information collected from farm operators through the crop reporting system of the former Bureau of

[1] For 1950, the Census of Agriculture wage rates and numbers employed related to the week preceding the enumeration. For 43 States, the average date of enumeration was Apr. 15–28; for the remaining 5 States the average date was Apr. 1–14.

[2] For 1954, the Census of Agriculture wage rates and numbers employed related to a specific week. For 33 States the week was Sept. 26–Oct. 2; for the other 15 States the week was Oct. 24–30.

[3] DUCOFF, LOUIS J. WAGES OF AGRICULTURAL LABOR IN THE UNITED STATES. Technical Bulletin No. 895, U. S. Dept. Agr., Washington, D. C. 127 pp. 1945.

Agricultural Economics. Based on a composite hourly rate, the wage belt maps for 1950 and 1954 would be expected to show a greater regional differentiation than the wage belt map for 1943, which is based on a single daily rate. Thus, no direct comparison can be made between the 1943 map and maps for later years. However, a general comparison of the geographic distribution of comparable wage levels gives an indication of the relative wage status of farm workers over the country, and the relative shifts in farm wage levels which occurred between the peak employment years of World War II and the years 1950 and 1954.

The 1943 map shows regular and progressive geographic gradations starting from a low point in the Southeastern States and extending in successively higher wage belts across the Great Plains, the Western Range area, and the Pacific States.

The trend toward higher average farm wage rates for the country as a whole is evident in the 1950 and 1954 wage belt maps. The lowest rate areas, which covered large sections of the South and parts of the Midwest in 1950, had practically disappeared by 1954. Only a part of this rise is accounted for by the seasonal difference in wage rates reported for the 1950 and 1954 censuses. The rates on which these maps were based are averages of reported wage rates in current dollars. No adjustment was made to account for changes in price levels or cost of living.

The Association Between Farm Wage Rates and Various Economic and Demographic Factors

Correlation coefficients were computed between the 1950 composite hourly wage rates and each of 16 items selected from the Census of Population and the Census of Agriculture for 1950, on the basis of their probable association with farm wage levels. The correlations were analyzed for economic regions and within regions for State economic areas.

The State economic areas used in this report were developed by Donald J. Bogue of the Bureau of the Census and Calvin L. Beale of the Agricultural Marketing Service.[4] They consist of counties grouped on the basis of economic and demographic similarities. The economic regions are State economic areas grouped in like manner, and by definition must cut across State boundaries. The familiar regional breakdowns ordinarily used by the Bureau of the Census are defined on a geographic basis and consist of groups of States.[5]

For convenience, the items selected were grouped in three broad categories with respect to their probable effect on farm wage rates: (1) Measures such as the rates of net migration and replacement ratios, which are indicative of the potential supply of farm labor; (2) size of farm and number of tractors per farm, which are related to the effective demand for labor; (3) and indexes of farm opera-

[4] BOGUE, DONALD J. AND BEALE, CALVIN L. ECONOMIC SUBREGIONS OF THE UNITED STATES. Series Census-BAE, No. 19. 47 pp. 1953.

[5] Hereafter in this report the Bogue-Beale regions will be referred to as *economic regions*, and the usual Bureau of the Census regions will be referred to as *geographic divisions*. State economic areas can be grouped to form either type of region.

tor levels of living, which are closely related to the level of farm productivity.

Farm labor supply variables, which had relatively high correlations with cash farm wage rates for the country as a whole, gave evidence of the "push" characteristics of rural versus the "pull" characteristics of urban labor markets. Replacement ratios for farm working age males, which provide a measure of underemployment in rural areas, represent the "push" exerted on the farm work force in areas of oversupply of farm labor. Net migration from farms provides a measure of the "pull" of nonfarm labor markets on the farm population, and indirectly the "push" of surplus farm labor.

Farm wages tended to be higher in areas in which underemployment was relatively low, and in areas of low migration from farms. They tended to be higher also where the extent of off-farm employment opportunities were greater; but the association was not as high as that of farm wages with replacement ratios and migration from farms.

On the labor demand side, farm wages tended to be higher in areas in which values of land and capital and average value of products sold were high. Wages also were positively correlated with average size of farm in acres and with livestock production as a percentage of all farm production; but the association was less marked than that of wages with value of land and buildings or value of products sold.

For the country as a whole, wage rates showed a strong positive association with farm level-of-living indexes.

At the regional level, the Upper Great Lakes economic region produced high or relatively high correlations between composite farm wage rates and all but three of the other factors. The three exceptions were average value of land and buildings, Economic Class I and II farms as a percent of all farms, and average size of farm. In this region, high positive correlations with wage rates were found for migration factors, extent of off-farm work, and percentage change in level-of-living indexes between 1940 and 1950. All other high correlations were negative. Economic Region X (South Center and Southwest Plains) had the next most significant correlations. With one exception, all of the factors related to the demand for labor showed significant correlations with wage rates. The exception was the percentage of commercial farms. Among the labor supply factors, only the replacement ratio for the rural working age group produced a significant correlation with farm wage rates in Economic Region X.

In several regions, only one or two factors showed statistically significant correlations with farm wage rates, and in Economic Region XII (the Pacific Northwest) none of the factors were significantly correlated.

Replacement ratios for the rural working age group showed significant correlations in six economic regions: Percentage of farms reporting tractors showed significant correlations in five economic regions. Farm-operator level-of-living indexes for 1940 and 1950 were positively correlated with farm wage rates in all economic regions except the Upper Great Lakes.

INTRODUCTION

More than 3,000,000 persons earn some cash wages on farms in the United States each year.[6] Many of these—children, youths, and housewives, for the most part—work on farms only during the peak of the harvest season. But for about a third, farm wages represent the major source of earnings during the year. According to the 1954 AMS survey of the hired farm working force, more than 800,000 workers put in 6 months or more at farm wage work during 1954. For this group, earnings from farm wages represent the major source of income during the year, and for many it is the only source.

Family farms often supplement family labor with hired workers during periods of peak activity. Larger farms employ more hired labor, and when this is the case, wages are a primary factor in cost of production. About 36 percent of the entire farm wage bill in 1949 was reported by the 6 percent of farms that were 500 acres or more in size, according to the 1950 Census of Agriculture. A small proportion of farms in this country use substantial numbers of hired workers; most of these are needed at critical periods of the production process. The hired agricultural worker and his wage earnings thus become important considerations in management of production and determination of production costs.

The study reported here is based mainly on information on farm wage rates from the 1950 and 1954 Censuses of Agriculture. From the data on various wage rates reported during the specified census survey week, a composite weighted hourly wage rate was computed for the country as a whole, and by geographic divisions, States, economic regions, and State economic areas (table 14). These composite rates were computed to reflect the proportions of hired workers paid by the hour, day, week, or month. The computation also takes account of piece rate workers.[7]

To investigate the significance of the relationship between farm wage rates and various factors affecting labor supply and demand, a number of items for which comparable information was available from the Census of Population and the Census of Agriculture for 1950 were selected for analysis. Simple and multiple correlations, and analysis of covariance were made in order to appraise the significance of the commonly assumed associations between wage rates and elements of labor supply or demand. Regional differences were also investigated.

CHARACTERISTICS OF THE HIRED FARM WORKING FORCE

The monthly average number of hired workers on farms in the United States represents about a fourth of the total farm work force.

[6] Since 1945, the estimate has varied between a high of 4.3 million (1950) and a low of 2.8 million (1946). Estimates of numbers of persons who earn cash wages on farms are given in AMS surveys of the hired farm working force, published for most years since 1945. They include persons 14 years of age and over in the civilian noninstitutional population at or near the end of the year. (THE HIRED FARM WORKING FORCE OF 1954, AMS–103. Agricultural Marketing Service, U. S. Dept. Agri., Washington, D. C. 26 pp. 1956.)

[7] The method of computing the composite hourly cash farm wage rate is described in Appendix B.

Since 1950 the level of hired farm employment has varied from a low of about 1 million in January to a high of about 3 million in September.[8] About half of all hired farm laborers are in the three southern geographic divisions.

Because persons who work on farms for wages at some time during the year are not all working on farms at the same time, estimates of average monthly employment understate the number of different persons who work for wages on farms during the year. In surveys made for the Agricultural Marketing Service by the Bureau of the Census, estimates have been made of the number of different persons who work on farms for wages at some time during the year (table 1).[9] An annual average employment of less than 2 million may thus involve more than 3 million persons who work for farm wages at some time during the year.

The level of hired farm employment varies far more than that of family workers in the course of a year. Where specialty crops require large amounts of seasonal labor as in the West, seasonal change is particularly sharp. In broad seasonal swings in farm employment many hired farm laborers work only short periods during the year.

TABLE 1.—*Number of farm wage workers who did any farm wage work during the year, United States, 1945–56* [1]

Year	Farm wage workers		
	Total	With 25 days or more of farm wage work	With less than 25 days of farm wage work
	Thousands	*Thousands*	*Thousands*
1945	3, 212	1, 965	1, 247
1946	2, 770	1, 953	817
1947	3, 394	2, 215	1, 179
1948	3, 752	2, 502	1, 250
1949	4, 140	2, 510	1, 630
1950	4, 342	----------	----------
1951	3, 274	2, 156	1, 118
1952	2, 980	1, 972	1, 008
1954	3, 009	1, 908	1, 101
1956	3, 575	2, 078	1, 497

[1] Data relate to persons 14 years of age and over in the civilian noninstitutional population at or near the end of the year.

Agricultural Marketing Service surveys of the hired farm working force, 1945–56.

[8] Based on the farm employment series published by AMS each month in Farm Labor.

[9] These estimates, made for most years since 1945, are based on information obtained for AMS by the Bureau of the Census in its regular Current Population Survey at or near the end of the year. Information is obtained for persons 14 years old and over in the civilian noninstitutional population who did farm work for wages during the year. Children under 14 years of age and foreign nationals brought in legally for temporary farm employment who have left the country by the end of the year are not covered by the survey. THE HIRED FARM WORKING FORCE OF 1954, op cit., p. 5.

About 1 out of 4 wage hands puts in 6 months or more at farm work, and approximately 1 in 7 works as much as 250 days or more at farm wage work in a year. Many farm workers supplement their farm earnings with wages earned at nonfarm jobs, and shorttime seasonal farm workers, of course, often earn most of their income from nonfarm jobs. About 12 percent of the hired farm working force consists of domestic migratory workers. Additional information on the characteristics of hired farm workers is contained in tables 2 and 3.

TABLE 2.—*Percentage distribution of farm wage workers with 25 days or more of farm wage work by cash wages earned during the year at farm wage work, by sex, United States, 1952 and 1954* [1]

Cash farm wages earned	All workers		Male		Female	
	1952	1954	1952	1954	1952	1954
Dollars	*Percent*	*Percent*	*Percent*	*Percent*	*Percent*	*Percent*
Under 100	10	8	7	6	24	16
100–199	20	15	15	11	38	33
200–399	20	22	19	18	24	34
400–599	11	10	13	11	5	5
600–999	15	14	16	16	7	7
1,000–1,999	17	18	21	22	2	4
2,000 and over	7	13	9	16	-------	1
Total	100	100	100	100	100	100

[1] Data relate to persons 14 years of age and over in the civilian noninstitutional population at or near the end of the year.
The Hired Farm Working Force of 1954, AMS–103. *Op. cit.*, p. 5.

TABLE 3.—*Percentage distribution of migratory and nonmigratory workers with 25 days or more of farm wage work, by chief activity, United States, 1949, 1952, and 1954* [1]

Chief activity	Migratory workers			Nonmigratory workers		
	1949	1952	1954	1949	1952	1954
	Percent	*Percent*	*Percent*	*Percent*	*Percent*	*Percent*
Farm work	48	48	59	67	56	61
Farm wage work	38	39	50	52	46	51
With nonfarm work	10	12	14	12	11	11
Without nonfarm work	28	27	36	40	35	40
Other farm work	10	9	9	15	10	10
Nonfarm work	13	17	12	10	10	9
Nongainful activity [2]	39	35	29	23	34	30
All activities	100	100	100	100	100	100

[1] Data relate to persons 14 years of age and over in the civilian noninstitutional population at the time of the survey.
[2] Includes a small number of workers who reported looking for work as their chief activity during the year.
The Hired Farm Working Force of 1954, AMS–103. *Op. cit.*, p. 5.

FARM WAGE RATES

Farm wage rates characteristically have varied from State to State and even from farm to farm. As attention to average rates for the country as a whole tends to obscure these differences, analyses of the structure of farm wage rates must be focused primarily on local and regional wage patterns and associated factors.

An elaborate and extensive report on farm wage rates published in 1945 by the U. S. Department of Agriculture,[10] drew upon (1) county and State farm wage expenditure data from the Census of Agriculture; (2) State and crop reporting district wage rate data from the Department's regular crop reporting statistical program; and (3) both types of wage data from special farm labor surveys made by the Department. In 1950 and 1954, the Census of Agriculture reported number of farm wage workers, hours worked, and wage rates paid by basis of payment for State economic areas. Table 4 shows the 1950 distribution of hired farm workers by basis of payment for the geographic divisions of the United States. Information on agricultural wages by basis of payment were not developed in censuses taken before 1950. This report is based on the farm wage information contained in the 1950 and 1954 Censuses of Agriculture. Wage rates developed from the censuses are compared with data from the Department's 1945 study of agricultural wages. Comparability of census data for 1950 and 1954 and other sources, including the wage information developed by AMS, is discussed in Appendix A.

The Composite Farm Wage Rate

Methods of payment are classified, broadly, according to whether workers are paid on a time or piece-work basis. Time rates may be classified as hourly, daily, weekly, or monthly rates, and each of these rates can be further classified according to perquisites received, such as meals, board and room, and house. The wage information developed in this report from the censuses of 1950 and 1954 refers only to cash earnings of farm workers. We did not attempt to estimate the cash value of perquisites received in addition to cash wages.

Because of the great variety in methods of payment of farm wages, various indexes and other composite measures of wage rates have been developed in the Department and elsewhere to provide an overall indicator of the level of farm wage rates. For many years, a composite weighted average wage rate has been published by the Department. This rate is based on reports received quarterly from crop reporters who report the average wage rates being paid in their locality. All time rates are converted to hourly equivalents and combined with hourly rates after weighting by the estimated number of hired workers paid each type of rate. Piece-rate workers are included by giving them weight equal to the average rate per hour without room and board. The result is a weighted composite hourly rate. By a similar method, a composite weighted hourly rate was developed from wage data in the 1950 and 1954 Censuses of Agriculture.[11]

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[10] DUCOFF, LOUIS J. WAGES OF AGRICULTURAL LABOR IN THE UNITED STATES. *Op. cit.*, p. 2.

[11] See Appendix B for description of method.

TABLE 4.—*Distribution of farm laborers by type of wage rate received, geographic divisions, United States, April–May 1950*

Geographic divisions	All workers [1]	Workers paid on basis of				
		Monthly rate	Weekly rate	Daily rate	Hourly rate	Piece rate
	Thousands	*Thousands*	*Thousands*	*Thousands*	*Thousands*	*Thousands*
New England	48	10	20	6	11	1
Middle Atlantic	121	47	31	12	26	5
East North Central	170	79	27	30	30	4
West North Central	159	82	12	34	26	5
South Atlantic	306	41	48	124	68	25
East South Central	180	20	20	118	17	5
West South Central	249	37	23	118	52	19
Mountain	89	43	5	16	21	4
Pacific	203	42	9	15	108	29
United States	1, 525	401	195	473	359	97

[1] Excludes hired workers who failed to report basis of payment.

1950 Census of Agriculture, Vol. II, Ch. IV, Table 15, pp. 282–290.

Geographic Differences in Average Rates

Variations in economic, social, and other institutional factors have operated to produce distinctive types of agricultural and labor practices. Geographic variations in average wage rates customarily follow the pattern revealed in most economic indexes of regional differences. In table 5 composite wage rates by geographic divisions for 1950 show

TABLE 5.—*Composite hourly cash farm wage rates by geographic divisions, United States, April 1950 and September-October 1954*

Geographic divisions	Composite hourly wage rate		Percentage change
	1950	1954	
	Cents	*Cents*	*Percent*
New England	64	96	50
Middle Atlantic	56	83	48
East North Central	51	82	61
West North Central	52	84	62
South Atlantic	42	59	40
East South Central	34	54	59
West South Central	43	62	44
Mountain	64	86	34
Pacific	85	103	21
United States	52	79	52

Computed in AMS from data published in Volume I, Census of Agriculture, 1950 and 1954.

a spread of 51 cents between the average rates for the East South Central States and the Pacific Coast States. The typical pattern shows rates lowest in the Southeast and highest in the Far West. Rates in the North Central and Middle Atlantic divisions were about the same as the national average. New England and Mountain divisions rates were higher than average. Composite farm wage rates computed from the 1954 Census of Agriculture indicate a sharp rise in average rates though the relative geographic positions are about the same as in 1950. As the 1950 census was taken in the spring of the year, and the 1954 census in the fall—near the harvest employment peak—the rise in average farm wages between the two censuses reflects a seasonal rise, as well as the longer-term upward trend in farm wages that occurred during those 4 years.

Comparison of Census and AMS Wage Data

Further insight into the changes in farm wage rates during recent years can be obtained by comparing census data with the farm wage series published quarterly by AMS. It may also provide an indication of the extent to which seasonal variations affect the comparison of composite farm wage rates developed from the 1950 and 1954 Censuses of Agriculture. But in comparing the two series certain differences between census and AMS data must be borne in mind. Census data are based on a sample enumeration of the actual amounts farmers were paying hired farm workers during a specified survey week.[12] AMS data are weighted averages of data collected quarterly by mail questionnaires from a national sample of farm operators. The farm operator is asked to report the average wage rate "at this time" (approximately the last week of the month) in his locality.

The AMS composite hourly wage rates and the rates computed from census figures were quite similar in April 1950, for the country as a whole and for the geographic divisions. The AMS rates were slightly lower than census rates in most geographic divisions. But in October 1954 the AMS rates were as much as 12 cents lower than the 1954 census figures. Except in three regions—East North Central, West South Central, and Pacific—the percentage increase between April 1950 and October 1954 was larger in the rates computed from the census than in the AMS rates.

Regional variations in farm wage levels were similar in the census and AMS in both 1950 and 1954. In both surveys the South Atlantic, East South Central, and West South Central divisions had the lowest average wage rates, and the Pacific division had the highest. Both estimates show considerable increases in farm wage rates between 1950 and 1954 in all regions.

In the AMS farm wage series about half of the increase between April 1950 and October 1954 represented seasonal fluctuation; the remaining half represented a longer-term increase in cash farm wage

[12] The 1950 Census of Agriculture reported farm wage rates as of the week preceding enumeration. The approximate average date of enumeration was April 15 to April 28. The AMS wage rates were reported for April 23–27 in 1950. The 1954 census reported farm wage rates for either of two survey weeks—September 26–October 2 or October 24–30. About two-thirds of the States were reported for the earlier date. The AMS reporting weeks were September 19–25 and October 24–30.

rates which has averaged about 4 percent annually during the past decade. If census rates are adjusted on the basis of the seasonal variation in the AMS series (table 6) it appears that April farm wage

TABLE 6.—*Comparison of composite hourly cash farm wage rates computed from Census of Agriculture data and AMS estimates of composite hourly cash farm wage rates by geographic divisions, United States, 1950 and 1954*

Geographic divisions	Estimates based on Census of Agriculture data					
	1950		1954		Percentage change	
	April	October [1]	April [1]	September/ October	April 1950 to April 1954	October 1950 to October 1954
	Cents	*Cents*	*Cents*	*Cents*	*Percent*	*Percent*
New England	64	72	90	96	41	33
Middle Atlantic	56	69	73	83	30	20
East North Central	51	70	65	82	27	17
West North Central	52	63	74	84	42	33
South Atlantic	42	47	55	59	31	26
East South Central	34	46	42	54	24	17
West South Central	43	56	50	62	16	11
Mountain	64	74	81	86	27	16
Pacific	85	91	101	103	19	13
United States	52	66	67	79	29	20

Geographic divisions	Agricultural Marketing Service estimates					
	1950		1954		1956	
	April	October	April	October	April	October
	Cents	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*
New England	62	70	80	84	85	96
Middle Atlantic	52	64	66	75	70	82
East North Central	48	66	62	78	65	84
West North Central	53	64	66	75	68	77
South Atlantic	40	45	50	53	52	58
East South Central	32	43	38	49	41	55
West South Central	43	56	52	64	55	70
Mountain	61	71	74	79	77	83
Pacific	86	92	103	105	107	112
United States	47	59	58	68	62	74

[1] October 1950 rates were obtained by adjusting the rates computed from April 1950 Census data on the basis of the April-to-October percentage difference in the AMS series in 1950. The April 1954 rates similarly were obtained by adjusting the rates computed from September/October 1954 Census data by the April-to-October percentage difference in the AMS series in 1954.

April 1950 and September/October 1954 estimates based on data in volume 1 of Census of Agriculture, 1950 and 1954. See Appendix B for method of computation.

AMS data on farm wage rates are from monthly issues of Farm Labor, 1950, 1954 and 1956.

rates rose faster between 1950 and 1954 than October rates in all geographic divisions of the United States. This would indicate a narrower range in seasonal fluctuation in 1954 than in 1950 for the country as a whole, though wide area variations remained in the extent of seasonal changes in farm wage rates. In the Pacific States, the September/October rate in 1954 was only 2 percent higher than the April rate; in the East South Central States it was 29 percent higher.

Farm Wage Belts

Figures 1a, 1b, and 1c show areas of similar average farm wages—"wage belts"—in the United States in October 1943, April 1950, and September and October 1954. The following basic differences should be observed in comparing the 1943 map with those of 1950 and 1954:

1. The 1943 map was based on the Department's crop reporting districts, and the 1950 and 1954 maps were based on State economic areas. Both crop reporting districts and State economic areas consist of groups of counties; but the boundaries of the crop reporting districts "tend to follow lines of demarcation between differences in farm characteristics",[13] whereas State economic areas were designed to provide areas that are economically homogeneous with regard to both agricultural and nonagricultural characteristics.

2. The 1943 map depicts geographic variations in wage rates on the basis of daily rates only, whereas the 1950 and 1954 maps show variations in composite hourly wage rates which were computed from monthly, weekly, daily, hourly, and piece-work cash rates. The comparison does not take into account changes in the average number of hours worked per day, an especially important consideration in view of the difference in the seasons during which the data were collected for different years. Rates reported are nominal wage rates rather than real wages, and do not take into account changes in the purchasing power of the dollar.

The Department's index of prices paid by farmers for items used in family living rose 48 percent between 1943 and 1950, and 11 percent between 1950 and 1954. The BLS consumer price index rose 39 percent between 1943 and 1950, and 12 percent between 1950 and 1954. But the BLS indexes are for selected cities and indicate considerable area variations in changes in the purchasing power of the dollar. These indexes for selected years are:

Bureau of Labor Statistics			U. S. Department of Agriculture			
(1947–49=100)			(1910–14=100)			
Year	Consumer Price Index (All items)	Wholesale Price Index (All items)	Year	Prices paid by farmers for:		Parity Index (Prices paid, interest, taxes, and wage rates)
				Family living expenses	Production expense	
1943	74.0	67.0	1943	160	164	171
1950	102.8	103.1	1950	246	246	256
1954	114.8	110.3	1954	274	252	281

U. S. Department of Labor, Bureau of Labor Statistics, official reports.
Crop Reporting Board, AMS, Agricultural Prices, Oct., 1956. Supp. 1, p. 45.

[13] THE AGRICULTURAL ESTIMATING AND REPORTING SERVICES OF THE UNITED STATES DEPARTMENT OF AGRICULTURE. Misc. Publication No. 703. 266 pp. U. S. Dept. Agr., Washington, D. C. 1949. Page 19.

There was a wide variation in the proportion of workers paid each type of rate. In 1950, monthly rates were the most heavily weighted in the Northeast and North Central states; the largest proportion of the workers worked at daily rates in the South; and most workers were paid on an hourly basis in the West. In all geographic divisions in 1954 the number of workers paid on an hourly or piece-work basis constituted a major part of all farm workers. This was undoubtedly because the 1954 data were collected in the fall harvest season. Based on the reported average hours worked per day, the hourly rate was usually considerably higher than the daily cash wage converted to an hourly basis. In 1954, only in New England was the computed wage per hour of workers paid by the day slightly higher than that of workers paid by the hour. Among the four broad geographic regions of the United States, the hourly rate was usually highest in 1954; the computed hourly rate of day workers was higher than that of monthly and weekly workers in the Northeast and North Central regions, but lower than that of monthly and weekly workers in the South and West.

3. The 1943 and 1954 maps were based on October and September wage rates, while the 1950 map was based on April rates. Thus, a comparison of the three will reflect not only the changes over the years, but also seasonal variations in the level of farm wage rates.

In all 3 years, the lowest wage rates prevailed in the southeastern part of the country. In 1943 this low wage area covered the entire southeastern and south central part of the United States, with wages rising in progressively higher wage "belts" in a northwesterly direction (fig. 1a). As wage levels have risen, the wage belts have become less distinct, with higher wage plateaus appearing in comparatively lower level plains.

By 1950 there had been an upward shift in farm wages in most of the country. The 10–19-cent wage belt disappeared and the size of the area where wages were less than 40 cents was considerably reduced. Average wage rates on almost the entire West Coast had shifted into the 80-cent and over belts; and farm wages in the northeast coastal area had risen from the 40-cent belt into higher levels ranging up to 80–89 cents. Florida wages shifted from the 30-cent belt into 50- and 60-cent belts.

The rise in farm wages appears even more vividly in the 1954 map. By 1954 the 20–29-cent belt had disappeared, and only two small areas appear in the southeast, where wages were as low as 30–39 cents. Wages were over 60 cents an hour in most of the nation; and over 80 cents in a large part of it. In the entire Pacific Coast, the northern tip of Maine, and other scattered areas, wages rose to $1.00 or more per hour.

These changes in the money wages of agricultural labor are quite striking. However, it must be reiterated that changes in the purchasing power of the dollar have in part offset the effect of the wage increases. For example, the seasonally adjusted composite hourly cash farm wage rates shown in table 6 indicate an increase in wages of 29 percent between April 1950 and April 1954. The index of prices farmers pay for family living expenses rose 11 percent in this same period. In terms of 1950 purchasing power then, the composite hourly farm wage rate for the United States rose only from 52 to 60 cents, rather than 67 cents, between April 1950 and April 1954; or in terms of 1943 purchasing power, the U. S. average hourly farm wage rate was only 35 cents in 1950 and 41 cents in 1954.

447139—58——3

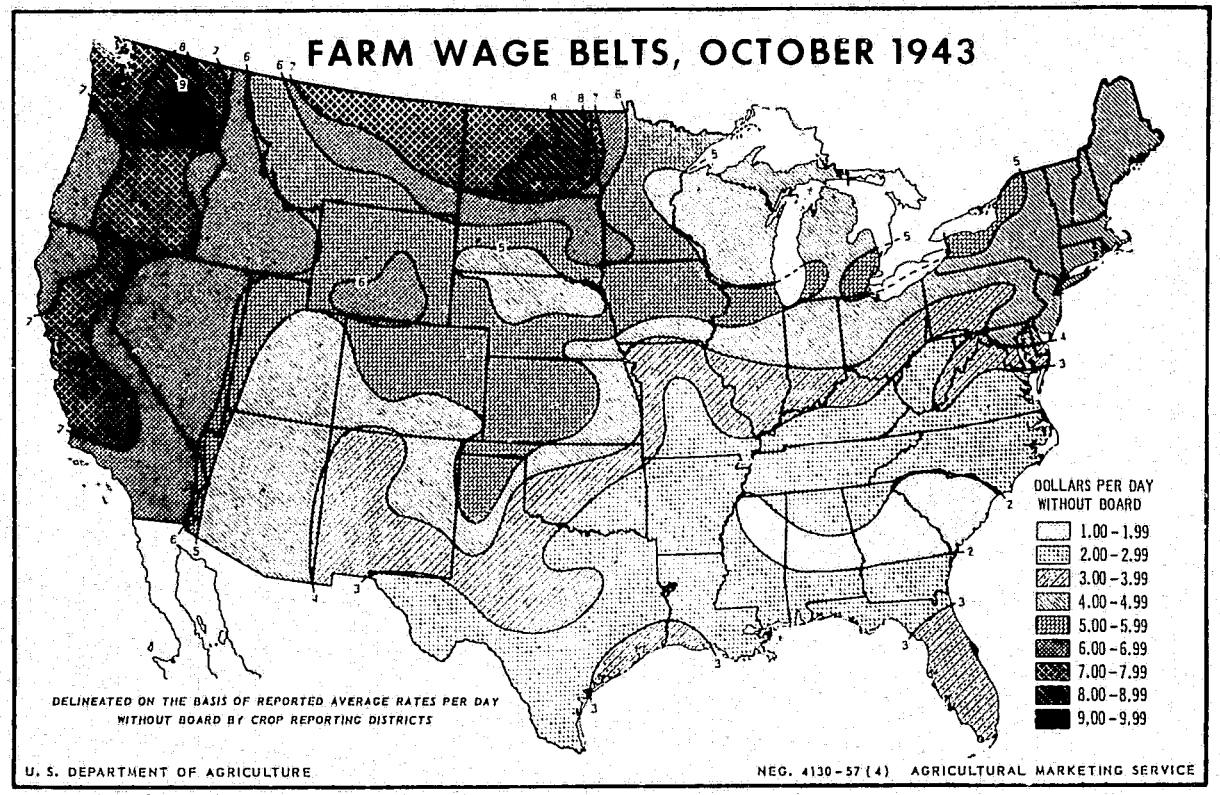
FARM WAGE BELTS, OCTOBER 1943
DOLLARS PER DAY WITHOUT BOARD
1.00 - 1.99
2.00 - 2.99
3.00 - 3.99
4.00 - 4.99
5.00 - 5.99
6.00 - 6.99
7.00 - 7.99
8.00 - 8.99
9.00 - 9.99
DELINEATED ON THE BASIS OF REPORTED AVERAGE RATES PER DAY WITHOUT BOARD BY CROP REPORTING DISTRICTS
U. S. DEPARTMENT OF AGRICULTURE
NEG. 4130-57 (4) AGRICULTURAL MARKETING SERVICE

Figure 1a.

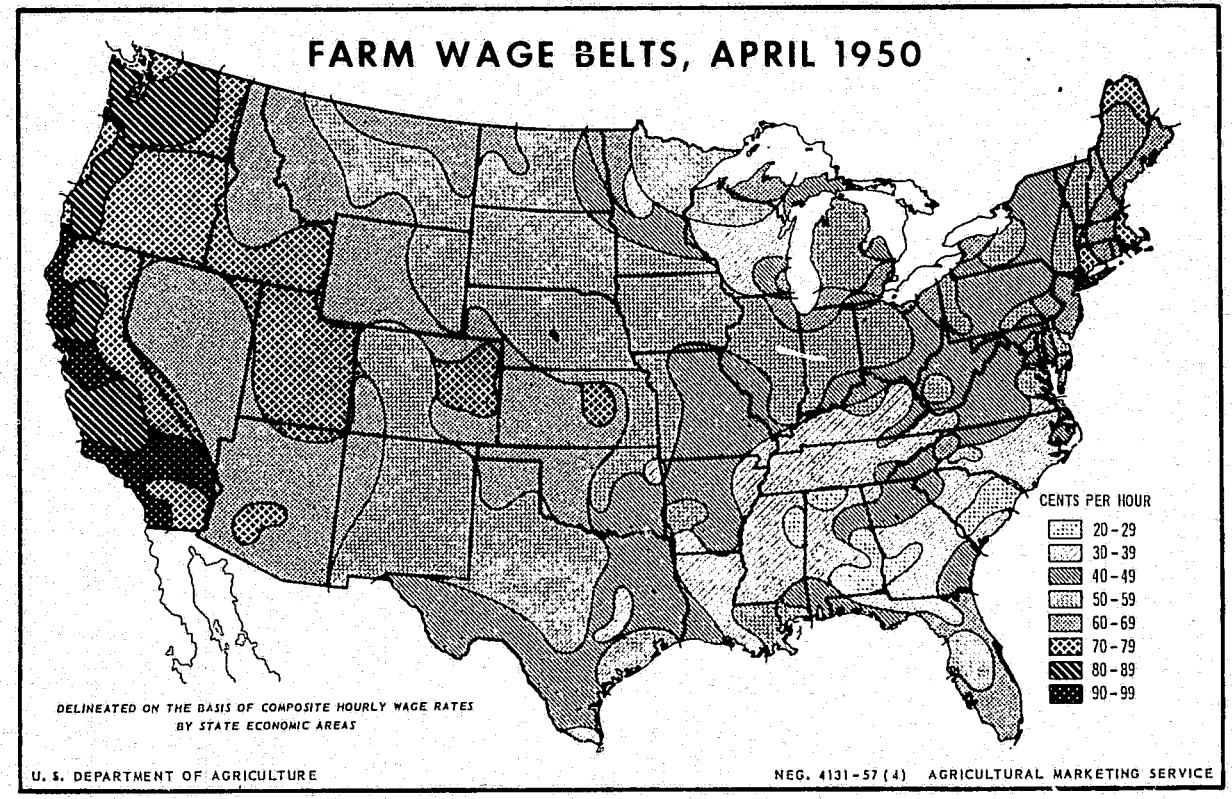
FARM WAGE BELTS, APRIL 1950
CENTS PER HOUR
20 - 29
30 - 39
40 - 49
50 - 59
60 - 69
70 - 79
80 - 89
90 - 99
DELINEATED ON THE BASIS OF COMPOSITE HOURLY WAGE RATES BY STATE ECONOMIC AREAS
U. S. DEPARTMENT OF AGRICULTURE
NEG. 4131 - 57 (4) AGRICULTURAL MARKETING SERVICE

Figure 1b.

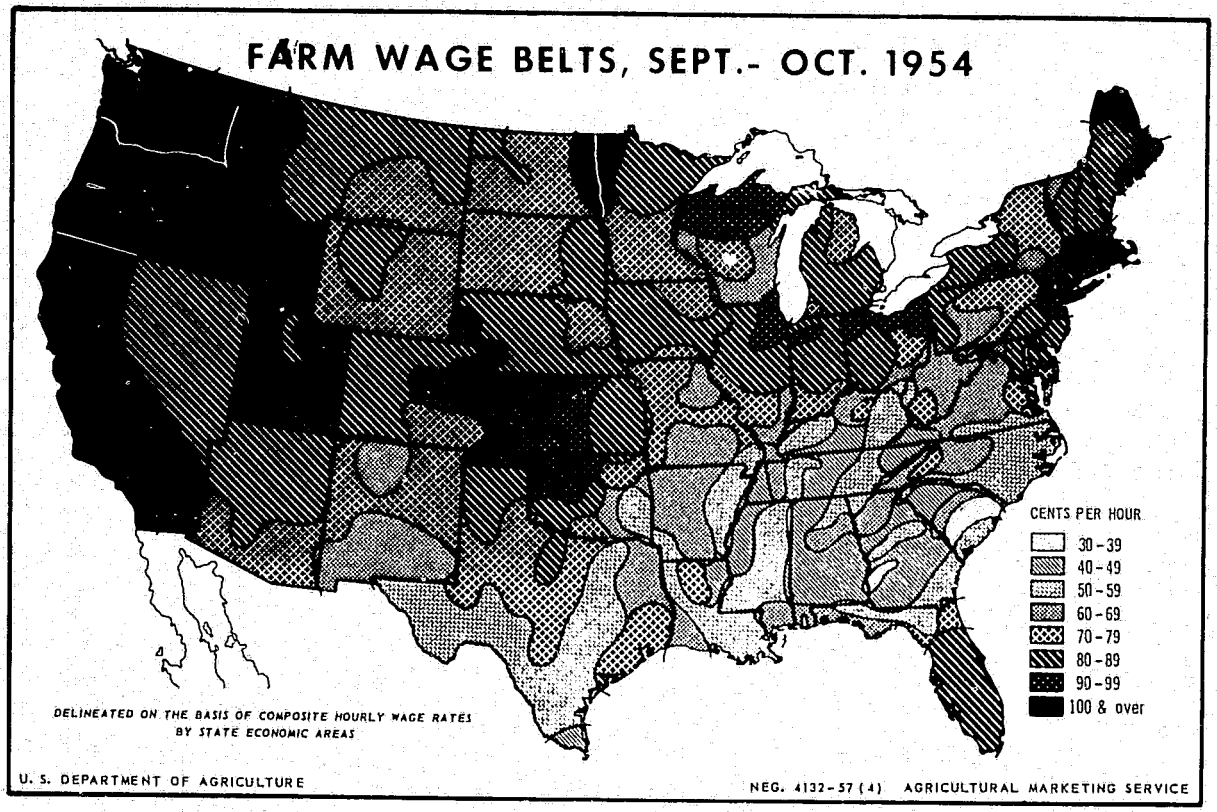
FARM WAGE BELTS, SEPT.- OCT. 1954
CENTS PER HOUR
30 - 39
40 - 49
50 - 59
60 - 69
70 - 79
80 - 89
90 - 99
100 & over
DELINEATED ON THE BASIS OF COMPOSITE HOURLY WAGE RATES BY STATE ECONOMIC AREAS
U. S. DEPARTMENT OF AGRICULTURE
NEG. 4132-57 (4) AGRICULTURAL MARKETING SERVICE

Figure 1c.

Changes in wage rates in nonfarm occupations of comparable skill and status also should be considered in evaluating the increase in agricultural wage rates.

FARM WAGE RATES AND FACTORS OF LABOR DEMAND AND SUPPLY

The Concept of Economic Regions

In 1950 the entire land area of the United States was subdivided into homogeneous statistical areas called "State economic areas." [14] This was accomplished by grouping counties having similar economic and demographic characteristics. Donald J. Bogue and Calvin L. Beale later developed a second, broader subdivision of "economic subregions" by combining similar State economic areas. In 1954, two additional and even broader delimitations, termed "economic regions" and "economic provinces," were introduced. Economic regions are combinations of economic subregions and economic provinces are combinations of economic regions. These four delimitations form a single integrated system of area classification which introduces the environmental or ecological component into social and economic studies. Bogue did not intend to substitute this system of economic areas for other ecological areas, but rather considered it "a necessary base upon which ecological areas may be plotted in order to discover more about ecological structure." [15]

Unlike State economic areas and economic subregions, economic regions and economic provinces do not have official status as units of area for reporting census and other statistics collected by the Government. But for the purpose of the present study, economic regions provide a highly useful basis for handling a large mass of wage and related data (fig. 2). In the analysis of farm wage rate differentials and related measures of labor demand and supply that follows, the economic region as a unit of area is used.

The composite hourly farm wage rates by economic regions for 1950 and 1954 are shown in table 7. The complete list of related factors used in the analysis is given in table 8.

By grouping data from State economic areas into the 13 economic regions, the geographic variation of farm wage rates was compared with variations of 16 specific items through analysis of covariance.[16] Thus, the association of farm wage rates with each of the factors and their regional variations were measured by "holding constant"

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[14] BOGUE, DONALD J. AND BEALE, CALVIN L. ECONOMIC SUBREGIONS OF THE UNITED STATES. Series Census-BAE, No. 19. 47 pp. 1953.

[15] BOGUE, DONALD J. AN OUTLINE OF THE COMPLETE SYSTEM OF ECONOMIC AREAS. Amer. Jour. Soc. 40: 136–139. 1954. Page 136.

[16] The region means of the composite wage rates for the State economic areas were used in making the analyses of covariance rather than the regional composite rates computed from ungrouped data (method described in Appendix B). The differences between the region means in table 13, computed from the data grouped by State economic areas, and the regional composite rates in table 7 computed from the ungrouped data, ranged from 0 to 3 cents per hour.

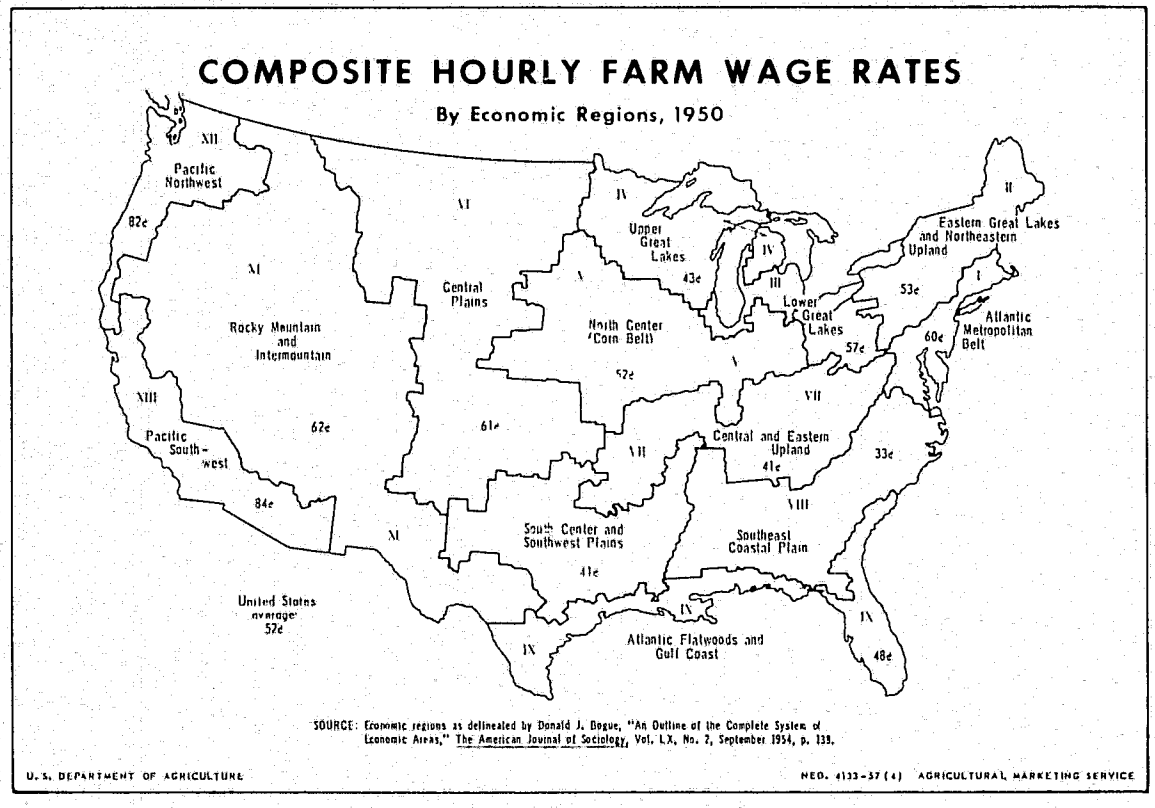
COMPOSITE HOURLY FARM WAGE RATES
By Economic Regions, 1950
XII
Pacific Northwest
82¢
XI
Rocky Mountain and Intermountain
XIII
Pacific South-west
62¢
84¢
X
United States average 52¢
VI
Central Plains
61¢
V
North Center (Corn Belt)
52¢
IV
Upper Great Lakes
43¢
III
Lower Great Lakes
57¢
II
Eastern Great Lakes and Northeastern Upland
53¢
I
Atlantic Metropolitan Belt
60¢
VII
Central and Eastern Upland
41¢
33¢
VIII
Southeast Coastal Plain
48¢
IX
South Center and Southwest Plains
41¢
Atlantic Flatwoods and Gulf Coast
SOURCE: Economic regions as delineated by Donald J. Bogue, "An Outline of the Complete System of Economic Areas," The American Journal of Sociology, Vol. LX, No. 2, September 1954, p. 139.
U. S. DEPARTMENT OF AGRICULTURE
NEG. 4133-57 (4) AGRICULTURAL MARKETING SERVICE

Figure 2.

TABLE 7.—*Composite hourly cash farm wage rates by 13 economic regions, United States, 1950 and 1954*

	Economic regions	Composite hourly wage rate	
		April 1950	Sep.–Oct. 1954
		Cents	*Cents*
I	Atlantic Metropolitan Belt	60	84
II	Eastern Great Lakes and Northeastern Upland	53	88
III	Lower Great Lakes	57	84
IV	Upper Great Lakes	43	75
V	North Center (Corn Belt)	52	81
VI	Central Plains	61	87
VII	Central and Eastern Upland	41	61
VIII	Southeast Coastal Plain	33	49
IX	Atlantic Flatwoods and Gulf Coast	48	64
X	South Center and Southwest Plains	41	60
XI	Rocky Mountain and Intermountain	62	78
XII	Pacific Northwest	82	108
XIII	Pacific Southwest	84	100
	United States	52	79

Data published in the 1950 and 1954 Censuses of Agriculture were basic to these computations made by the Agricultural Marketing Service.

geographic location and each of the 16 selected items in turn while the association between farm wage rates and one of the others was investigated.[17]

Factors Selected for Analysis With Composite Farm Wage Rates

Like all socio-economic phenomena, the level of farm wage rates is a result of many economic, demographic, and social forces. The 1950 Census of Population and Census of Agriculture provided opportunity to investigate the association of farm wage rates and other items reported for State economic areas. Factors selected were: (1) Measures of farm labor supply, such as rates of net out-migration from the farm population, extent of off-farm work by farm operators, and extent of nonfarm work by the rural-farm population; (2) measures of the demand for farm labor, such as economic size of the farm enterprise, extent of use of tractors, and ratio of large-scale farms to all farms; and (3) indications of farm productivity and farmers' ability to pay as measured by farm-operator family level-of-living indexes.

[17] The method of analysis followed is described by HAGOOD, MARGARET JARMAN, AND PRICE, D. O., STATISTICS FOR SOCIOLOGISTS. 575 pp. 1952. Chapter 24. For another application to analysis of demographic data, see BOGUE, DONALD J. AND HARRIS, DOROTHY L. COMPARATIVE POPULATION AND URBAN RESEARCH VIA MULTIPLE REGRESSION AND COVARIANCE ANALYSIS. Scripps Foundation Studies in Population Distribution No. 8. 75 pp., illus. Miami University, Oxford, Ohio. 1954.

TABLE 8.—*Correlation coefficients of composite cash farm wage rates with selected factors, for 361 State economic areas, 1950* [1]

	Factors	Correlation with composite farm wage rates	Significance (F)
	Farm labor supply		
X_2	Rate of net out-migration from the total rural-farm population, 1940–50	−.408	71.5***
X_3	Rate of net out-migration from the 1940 rural-farm population aged 15–19, 1940–50	−.395	66.2***
X_4	Percent of rural-farm population employed in nonagricultural industries, 1950	.168	10.4**
X_5	Percent of farm operators reporting 100 or more days off-farm work in 1949	.262	26.5***
X_{17}	Replacement ratio for rural-farm men in working age group 25–69, 1950–60	−.470	101.6***
	Farm labor demand		
X_6	Average value of land and buildings per farm, 1950	.576	178.1***
X_7	Percent of farms reporting tractors, 1950	.487	111.9***
X_8	Percent commercial farms comprised of all farms, 1950	.117	5.0*
X_9	Percent Economic Class I and II farms comprised of all farms, 1950	.526	137.1***
X_{10}	Average value of products sold per farm, 1950	.545	151.6***
X_{11}	Average size of farm in acres, 1950	.245	22.8***
X_{12}	Average value of livestock per farm, 1950	.226	19.3***
X_{13}	Percent livestock and livestock products are of all products sold, 1950	.113	4.6*
	Level of living of farm operators' families		
X_{14}	Farm-operator family level-of-living index, 1940	.670	291.8***
X_{15}	Farm-operator family level-of-living index, 1950	.657	273.0***
X_{16}	Percentage change in farm-operator family level-of-living indexes, 1940–50	−.577	179.3***

[1] See Appendix C for definitions and explanations of these factors.

***Significant at the .001 level.
** Significant at the .01 level.
* Significant at the .05 level.

Comparisons of Differentials in Farm Wage Rates and Measures of Labor Demand and Supply

In developing the analysis of covariance, the total association between farm wage rates and the factors of labor demand and supply were first considered for the country as a whole, without regard to regional classification.

The relationship of each socio-economic factor to cash farm wages and wage levels was estimated through correlation analysis and

particularly analysis of covariance in which the effects of regional variations could be analyzed.

Because factors of farm labor demand and supply are not distributed symmetrically over the country, one would expect simple correlations of composite cash farm wage rates and any one of the factors to give relatively low correlation coefficients. The results of simple correlation analysis shown in table 8 indicate this to be the case. When the values of each factor are correlated with composite hourly farm wage rates for the country as a whole, the resulting r's range from .113 to .670. All of these r's are, however, significant at the .05 level.

Wage Rates and Labor Supply

It is not surprising that the 1950–60 average United States replacement ratio for rural-farm men aged 25 to 69 was one of the supply factors most strongly associated with the level of farm wages. Farm wages tend to be lower in areas where the supply of men reaching working age is larger than the number leaving this age group or, more directly, is larger than the number needed to meet local farm labor requirements. The long-term downward trend in farm labor requirements and the relatively high birth rates in some rural areas, particularly those areas of low farm income in which the absorption of the available labor supply has been least successful, have worked to keep farm wages depressed and to intensify the problem of rural underemployment. The pull of more attractive labor markets was reflected in rates of net migration from the rural-farm population which appeared to have a strong association with the level of farm wages. In this case the relationship was negative, high rates of out-migration being associated with low farm wage rates.

On the other hand, composite hourly cash farm wage rates appeared to have relatively low correlation with the proportion of rural-farm population employed in nonagricultural industries for the country as a whole, or the proportion of farm operators reporting 100 or more days of off-farm work in 1949. These correlation coefficients are computed from the 361 State economic areas without taking into account regional classifications. As is shown in the discussion which follows, these factors were quite strongly associated with farm wage levels in some economic regions where alternative employment opportunities exist in abundance and in others where a serious degree of underemployment exists among the rural-farm population. However, the relatively low total associations shown in table 8 indicate that there were more regions in which these factors were not significantly related to the level of farm wages.

Wage Rates and Labor Demand

Factors associated with the demand for farm labor which reflect the economic size of the farm operation and the farmer's ability to pay appeared to have the strongest associations with the level of farm wage rates. There were high correlations between the composite wage rate and the average value of land and buildings per farm, the proportion of Economic Class I and II farms, the proportion of farms reporting tractors in 1950, and average value of products

sold per farm. On the other hand, commercial farms as a proportion of all farms, and average size of farm had low correlations with the composite wage rate. Commercial farms [18] as a proportion of total farms varied comparatively little between areas (table 12). Furthermore, since commercial farms comprised an average of about 70 percent of all farms in the United States and hired 92.5 percent of total hired workers in 1950 and 95.8 percent of all hired workers in 1954, the inclusiveness of the broad category of commercial farms obscured possible variations among areas that might be associated with the level of farm wage rates.

Average size of farm, on the other hand, varied considerably throughout the country, ranging from 88 acres in the Atlantic Metropolitan Belt to 1,332 acres in the Rocky Mountain and Intermountain area (table 12). However, the relationship between size of farm in acres and the level of farm wages is not clear cut. As indicated later the character of the farm enterprise and its economic scale in terms of value of products sold bear a closer relationship to changes in the level of farm wages than the extent of acreage per farm.

With the effect of regional variation unaccounted for, farm wage rates appeared to have little association with the average value of livestock per farm or the percentage livestock and livestock products contributed to the value of products sold. But total correlation fails to show the variation in degree of association between farm wage levels and the percentage of livestock and livestock products sold. Relatively high correlation coefficients were found in some of the dairy farming regions and in at least one stock grazing region. The complement of this variable would be the percentage of the value of production accounted for by crops. This might be expected to show a low negative correlation with farm wage levels in 1950. Since the 1954 census was taken in the fall of the year when higher harvest season wage rates prevailed and more seasonal workers were employed, it may be conjectured that the correlation between percentage value of livestock products and farm wage levels was higher in the fall of 1954 than in the spring of 1950.

Wage Rates and Level-of-Living Indexes

Farm wage rates were strongly associated with farm-operator family level-of-living indexes for both 1940 and 1950. Farm wages were highest in the areas where the level of living was comparatively high. Between 1940 and 1950 the highest percentage increases in the farm-operator family level-of-living indexes occurred in areas where the index was relatively low in 1940. Thus, there was a negative relationship between the composite wage rate and the percentage change in the level-of-living indexes, that is, the 1940–50 percentage changes in the level-of-living indexes were highest in areas where wages were lowest in 1940.

[18] Commercial farms include all farms with a value of farm products sold of at least $250, except that farms with a value of production as low as $250 to $1,199 are defined as commercial farms only provided the farm operator worked off the farm less than 100 days, or provided the income the farm operator and members of his family received from nonfarm sources was less than the value of all farm products sold.

Interdependence of Wage Rates and Other Factors

The techniques of partial and multiple correlation brought out some interesting findings on the association between farm wage rates and factors of labor demand and supply. Of the selected items which have been assumed to represent various aspects of the demand for farm labor, X_6, average value of land and buildings per farm, showed the highest simple correlation with farm wage rates: +.576. It was also noted, as was to be expected, that X_6 was highly correlated with the other factors of labor demand, from +.588 (percent of farms reporting tractors) to +.906 (average value of products sold per farm). Item 6, therefore, was selected as an indicator of labor demand for partial and multiple correlation analysis with farm wage rates and factors of labor supply.

On the labor supply side, X_{17}, replacement ratio for working age group 25–69, 1950–60, had the highest zero-order correlation with farm wage rates: −.470. The correlation between X_4, percent of rural-farm population employed in nonagricultural industries, and X_5, percent of farm operators reporting 100 or more days of work off the farm, was +.924. Therefore, X_5 (which had a somewhat higher correlation with wage rates than X_4) was used to represent the element of alternative employment opportunities. The replacement ratio, X_{17}, was used as a measure of population pressure on the land, or underemployment.

The representative items of labor demand and supply are:

X_6 : factors related to demand for farm labor
X_5 : measure of alternative employment opportunites (supply)
X_{17} : population pressure or underemployment (supply)
X_1 : composite hourly wage rate

The simple, partial and multiple correlation coefficients were as follows:

$r_{16}=+.576$

$r_{16.5}=+.686$
$r_{16.(17)}=+.604$

$r_{16.5(17)}=+.688$

$r_{15}=+.262$

$r_{15.6}=+.513$
$r_{15.(17)}=+.163$

$r_{15.6(17)}=+.439$

$r_{1(17)}=-.470$

$r_{1(17).5}=-.431$
$r_{1(17).6}=-.510$

$r_{1(17).56}=-.437$

$R_{1.56}=+.713$
$R_{1.5(17)}=+.492$
$R_{1.6(17)}=+.711$
$R_{1.56(17)}=+.775$

The demand for farm labor, as represented by X_6, appears to bear closer association to wage rates than either factor of labor supply. The correlation between wage rates and labor demand is improved only slightly when the effects of either factor of labor supply are allowed for. On the other hand, the correlation between wage rates and off-farm work or underemployment is substantially increased when the effects of labor demand (X_6) are accounted for. Moreover, allowing for the average effect of X_{17} decreases the association between wages and factor X_5, the extent of alternative employment oppor-

tunities. Some of the apparent association between wage rates and alternative employment opportunities is accounted for by the relationship between underemployment and the extent of alternative employment opportunities. The relatively greater effect of labor demand on wage rates is also apparent in the multiple correlation coefficients. The Rs obtained using X_6, the labor demand factor, and either factor of labor supply, X_5 or X_{17}, are greater than the R obtained using only factors of labor supply ($R_{1.5(17)}$). Apparently, average value of land and buildings per farm is a strong indicator of farm labor demand. As noted before, average capitalization per farm was highly correlated with other elements of farm labor demand. Moreover, all factors of labor demand investigated were rather highly intercorrelated except X_{13}, percent livestock and livestock products are of all products sold.

On the other hand, the selected factors of farm labor supply were not strongly correlated with each other except for X_4 and X_5 as noted earlier. Since changes in the supply of labor are closely linked to a broad range of socio-economic factors and personal motivations, the selected factors of farm labor supply are likely to be more diverse than those of labor demand in which the economic element is predominant. This could be merely a result of the limitations of the items available from the census which have been assumed to represent elements of labor demand. It is more likely, as indicated earlier, that the factors which influence the supply of farm labor are far more complex and diverse than those influencing the demand for farm labor.

Such speculation can easily be pushed too far. Only 60 percent of the area variations in cash wage rates are "explained" by the variables of labor demand and supply used ($R^2=.60$). Higher order correlations would, of course, increase the amount of variation accounted for by the factors employed but with a lessening of reliability.[19]

It should be remembered that the correlation coefficients developed in the foregoing analysis are "total" correlations in the sense that they do not take into account regional variations in wage rates or labor demand and supply. Regional aspects of the association of wage rates and the selected factors will next be evaluated through the techniques of analysis of covariance.

The Regional Effect

The 1950 average composite hourly wage rates for the 13 economic regions shown in table 7 range from 33 cents to 84 cents. Analysis of variance shows that the regional differentials are significant, that is, the chances are better than 999 in 1,000 that the regional differences are not due to chance fluctuations. Similarly, the regional variations in the other factors under investigation were found to be significant (column 2, table 9).

The total correlations between farm wage rates and each of the variables were found to be significant, and composite farm wage rates as well as each of the selected variables showed strong regional differences. We now wish to discover whether the association between composite wage rates and each of the other variables for the individual

[19] SNEDECOR, GEORGE W., STATISTICAL METHODS. Iowa State College Press. Fifth Edition. 534 pp. 1956. Pp. 434–435.

TABLE 9.—*Analysis of variance and covariance, composite hourly cash farm wage rates, selected factors, and economic regions, 1950*

Selected factors	Significance of association between composite hourly wage rates and each of the other selected factors for 361 State economic areas (F)	Significance of association of composite hourly wage rates and each of the other selected factors with regional classification (F)	Significance of differences between individual region regressions of composite hourly wage rates on each of the other selected factors (F)	Significance of the partial association between composite hourly wage rates and regional variation when regional differences in each of the other selected factors have been allowed for (F)	Significance of the partial association between composite hourly wage rates and each of the other selected factors when variations in regional location are allowed for (F)
1		65. 04***			
2	71. 5***	23. 97***	1. 84*	52. 7***	15. 1***
3	66. 2***	21. 52***	2. 06*	50. 2***	(1)
4	10. 4**	30. 16***	2. 02*	72. 3***	38. 6***
5	26. 5***	29. 45***	[1] 1. 37	65. 3***	27. 3***
6	178. 1***	31. 09***	5. 73***		
7	111. 9***	70. 70***	2. 67**		
8	5. 0*	23. 73***	1. 88*	64. 3***	[1] 2. 7
9	137. 1***	25. 09***	4. 14***		
10	151. 6***	34. 37***	5. 45***		
11	22. 8***	28. 71***	6. 68***		
12	19. 3***	24. 04***	4. 88***		
13	4. 6*	27. 78***	5. 67***		
14	291. 8***	74. 13***	4. 42***		
15	273. 0***	65. 11***	4. 32***		
16	179. 3***	35. 30***	3. 75***		
17	101. 6***	13. 07***	3. 99***		

[1] Not significant at the .05 level.

***Significant at the .001 level.
**Significant at the .01 level.
*Significant at the .05 level.
For identification of factors, see table 8.

economic regions are sufficiently similar that we can assume that the character of the relationships do not differ significantly from one region to another. Column 3 of table 9 indicates that the average relationship (line of regression) between farm wage rates and most of the other variables differed widely among the regions. For these variables, an assumption of uniformity of regional relationship with wage rates appears to be unwarranted. Although the *correlation* between wage rates and such variables (for example, average value of land and buildings or average value of products sold) was relatively high, the test made in column 3 of table 9 indicates that the character of the association within regions (as represented by the *slope* of the line of regression) differed to a greater extent than could be attributed to chance. As we shall see later in the discussion of the association between wage rates and the variables of labor demand and supply within the separate regions, the relationship may change from positive to negative from one region to the next. For example, higher farm wages were associated with higher average farm sales in the Atlantic Metropolitan Belt, whereas higher farm wages were associated with lower average farm sales in the Upper Great Lakes region. For these relationships, investigation at the regional level would appear to be more fruitful than further study of the over-all associations.

The next step in analyzing the relationship between farm wages and the selected variables of labor demand and supply is to determine whether the geographic differentials in farm wage rates can be accounted for by the regional differences in the other variables. However, since the statistical procedure for testing this possibility (analysis of covariance) involves an assumption of uniformity in the regional relationship between the variables in question, the test cannot be made for those factors which show highly significant differences among their regional relationships with farm wage rates. But several of the regressions tested in column 3 of table 9 showed sufficiently slighter differences between regions to make the analysis of covariance feasible. The nature of the association as indicated by the individual region regressions, between composite wage rates and off-farm work by farm operators (X_5) showed no significant differences between regions; the regional regressions of wage rates with nonfarm employment (X_4), net migration of the rural-farm population (X_2 and X_3), and proportion of commercial farms (X_8) showed regional differences significant only at the .05 level. With respect to these five variables, then, the regional classification does not add materially to our ability to predict levels of farm wages. Note that four of these variables are measures of farm labor supply.

Column 4 of table 9 shows the results of the analysis of covariance for the five variables which showed the most uniformity of relationship with wage rates. Observe that the variance in farm wages (column 1) is reduced after allowance is made for regional differences in migration from the rural-farm population (X_2 and X_3), but larger after adjustment for regional differences in nonfarm and off-farm employment (X_4 and X_5) and for percentage of commercial farms (X_8). Yet regional differences in farm wages remain highly significant after regional differences in each of these factors were taken into account. Regional differences in no one of these five factors can wholly account for the regional variations in farm wage rates.

We may now turn the question around and ask, Is there a significant association between farm wage rates and any of these five factors after regional variations have been "removed" statistically? That is to ask if there is a significant average association between farm wages and any of these factors without regard to region differences. Column 5 of table 9 indicates no significant within-region association between farm wage levels and net out-migration of rural-farm youth (X_3) or percent of commercial farms (X_8). But total net migration from the rural-farm population (X_2) and nonfarm and off-farm employment (X_4 and X_5) each showed significant although low correlation with the level of farm wage rates after removal of regional variance (see table 10).

TABLE 10.—*Correlation and regression coefficients for composite hourly cash farm wage rates and selected factors, 1950*

Factors (X_i)	Total correlation (r)	Total regression (b)	Within-region correlation (r)	Between-region correlation (r)
2	−.408	−.528	−.204	−.579
3	−.395	−.488	−.004	−.724
4	.168	.157	.317	.075
5	.262	.323	.270	.265
6	.576	.344	.133	.837
7	.487	.282	.218	.603
8	.117	.088	−.088	.275
9	.526	.686	.123	.840
10	.545	.401	.097	.830
11	.245	.303	−.197	.549
12	.226	.252	−.200	.550
13	.113	.068	−.015	.205
14	.670	.746	.421	.774
15	.657	.706	.371	.785
16	−.577	−.349	−.315	−.746
17	−.470	−.544	−.370	−.645

For identification of factors, see table 8.

For the latter three variables, particularly X_4 and X_5, regional location has a relatively minor influence on their degree of association with farm wage rates. Thus, aspects of farm labor supply involving alternative employment opportunities are seen to have a universal effect on farm wage rates although as Ducoff and, more recently, Weatherford, have pointed out, alternative opportunities have a much greater effect on labor supply and farm wage rates in highly industrialized areas.[20]

In the case of the remaining factor of labor supply (X_{17}), the movement of wage rates seems to be even more sensitive to the pressure of surplus farm labor in regions which have great industrial centers (table 12). The relationship of rural underemployment to farm wages

[20] DUCOFF, LOUIS J., *ibid*, page 61. WEATHERFORD, WILLIS D., JR. GEOGRAPHIC DIFFERENTIALS IN AGRICULTURAL WAGES IN THE UNITED STATES. 99 pp., illus., Harvard University Press. 1956. Page 84.

also is affected by regional conditions on the labor demand side. If the seasonal demand for farm labor is heavy, variations in the level of underemployment will be accompanied by market variations in wage rates. That is, the slope of the regression of wage rates on replacement ratios will be steep as is indicated in Economic Regions I, III, IV, IX and XIII for factor X_{17} in table 12. All of these regions are heavy users of seasonal farm labor and all of them depend on migratory workers during a part of the growing season.

In the association between farm wage rates and underemployment as well as each of the other selected variables, regional location strongly influences either the degree of association (correlation), or the character of the relationship (line of regression) or both (table 10). These relationships are affected by the regional differences in the economic institutions upon which the farm enterprise is based and the physical environment in which it exists.

A closer look at farm wage rates and factors of labor demand and supply within the 13 economic regions will provide further insight into the underlying causes of variations in farm wage rates.

Regional Comparisons

The southeastern part of the United States (Economic Regions VII, VIII, IX and X) is generally characterized by one-crop farming operations typified by cotton or tobacco farms. Lack of diversification imparts a rigidity to the farm enterprise that increases the hazards of economic fluctuations. Characteristics of the soil and terrain and the existence of underemployment among the rural-farm population have slowed mechanization of farm production even where this is possible. Large quantities of labor are available through sharecropper and other tenant farming arrangements which generally include the use of large numbers of unpaid family workers. Alternative employment opportunities, while increasing, are still relatively scarce in the South. Migration from the rural-farm population in the South has been relatively high for the total rural-farm population as well as for farm youths seeking their first full-time jobs. The ratios of numbers of men entering the working age group to those leaving it were also high compared to other parts of the country. The general picture is one of relatively low levels of living and low farm wage rates; low proportions of nonagricultural employment; and small farms with low capital investment, comparatively few livestock, and relatively low values of farm production (fig. 3 and table 13).

In such circumstances it is not surprising to find that the State economic areas having the highest net migration or replacement ratios among the rural-farm population[21] often have the lowest wage rates. Region VII, the Central and Eastern Upland, was the only low-wage region where there was no significant relationship between the level of wages and the magnitude of these population changes. This region, just north of the one-crop area, is characterized by general farming, and out-migration is somewhat lower than in the regions farther south. However, in Region VII, as well as Regions VIII and IX, there was a significant association between the level

[21] For an explanation of the migration and replacement ratios, see Appendix C.

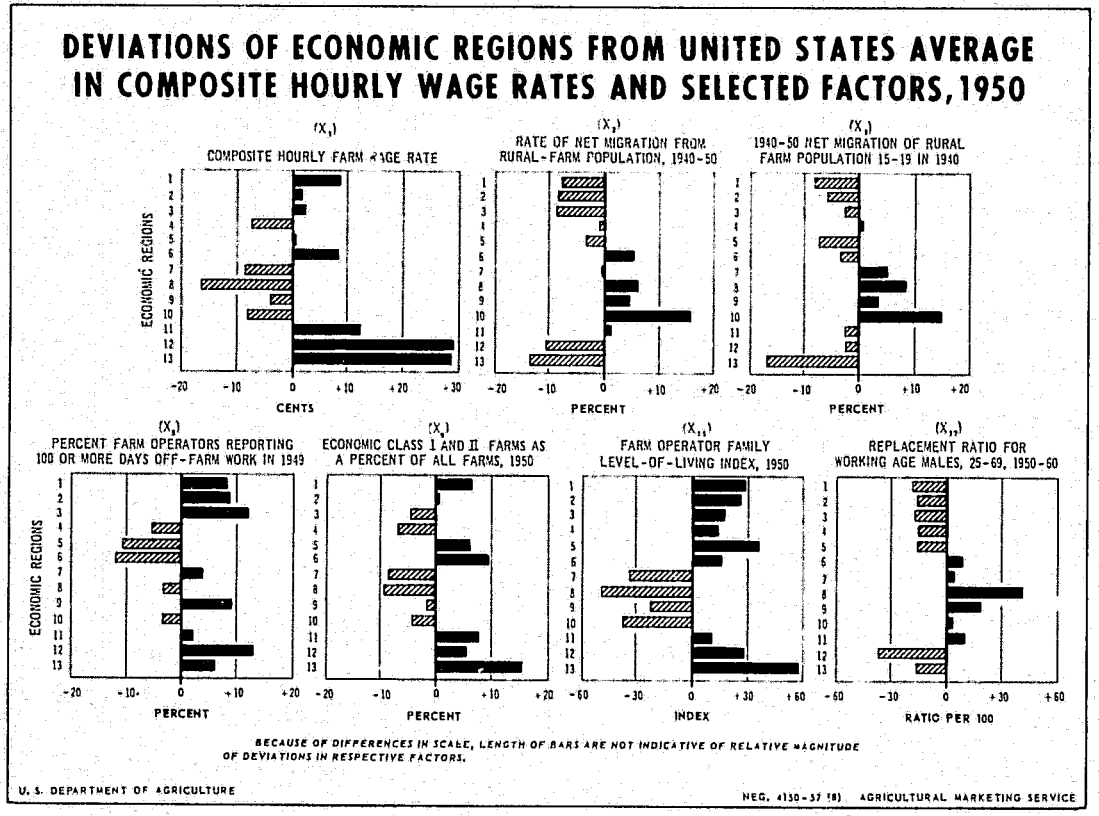
DEVIATIONS OF ECONOMIC REGIONS FROM UNITED STATES AVERAGE IN COMPOSITE HOURLY WAGE RATES AND SELECTED FACTORS, 1950
(X1) COMPOSITE HOURLY FARM WAGE RATE
(X2) RATE OF NET MIGRATION FROM RURAL-FARM POPULATION, 1940-50
(X3) 1940-50 NET MIGRATION OF RURAL FARM POPULATION 15-19 IN 1940
(X8) PERCENT FARM OPERATORS REPORTING 100 OR MORE DAYS OFF-FARM WORK IN 1949
(X9) ECONOMIC CLASS I AND II FARMS AS A PERCENT OF ALL FARMS, 1950
(X11) FARM OPERATOR FAMILY LEVEL-OF-LIVING INDEX, 1950
(X12) REPLACEMENT RATIO FOR WORKING AGE MALES, 25-69, 1950-60
ECONOMIC REGIONS
CENTS
PERCENT
INDEX
RATIO PER 100
BECAUSE OF DIFFERENCES IN SCALE, LENGTH OF BARS ARE NOT INDICATIVE OF RELATIVE MAGNITUDE OF DEVIATIONS IN RESPECTIVE FACTORS.
U. S. DEPARTMENT OF AGRICULTURE
NEG. 4130-57 (8) AGRICULTURAL MARKETING SERVICE

Figure 3.

of farm wages and the prevalence of nonagricultural employment and off-farm work. Where alternative employment opportunities did exist in these regions, farm wages tended to be higher.

In Region VIII, the Southeast Coastal Plain, covering parts of Virginia, the Carolinas, Georgia, Alabama, Mississippi, and Tennessee, the factors reflecting demand for farm labor appeared to have little significance with regard to the level of wages. There was some tendency for wages to be lower in State economic areas where the percentage of commercial farms was higher and where the average size of farms was larger.

For example, in the State economic areas of southeastern Alabama and southwestern Georgia, farm wages were below the regional average and farm acreages and percent of commercial farms were above the regional average in 1950. On the other hand, State economic areas in the textile areas of the Carolinas had relatively high farm wages, small farms, and low percentages of commercial farms. In the Alabama-Georgia State economic areas mentioned, there is an almost complete lack of alternative employment opportunities, whereas the Carolina areas are in the heart of the southern textile district in which the proportion of the rural-farm population employed in nonfarm work is greater than the proportion employed in agriculture. In Region VII wages tended to be higher where there were more Economic Class I and II farms and where the proportion of livestock in total farm sales was greater; but again, these associations were not highly significant.

The demand factors appeared to be much more important in determining the level of farm wages in Economic Region X, the South Center and Southwest Plains just west of the Mississippi (figs. 2 and 3 and table 11); but these apparently had no particular bearing on the level of farm wage rates in Economic Region IX, the Atlantic Flatwoods and Gulf Coast region. This region has somewhat different characteristics from the rest of the South. It has a considerable area of nonfarm territory in Florida and some general farming areas, but is especially noted for fruit, truck, and specialized farming (including rice and sugar cane). Generally, the proportion of commercial farms is low in this region, but the average size of farm is large, the value of capital investment is relatively high, and the value of products sold is high.

In Economic Region IV, the Upper Great Lakes (the lakes cut-over fringe in northern Minnesota, Wisconsin and Michigan) dairy farming is combined with general farming or the raising of hay or potatoes, and the value of livestock per farm is higher than average. Generally, farming is on a small scale. Although the proportion of commercial farms is relatively large in this region, the percentage of Economic Class I and II farms is low, the average size of farms is small, capital investment aside from tractor ownership is low, and the value of products sold is low. Among the rural-farm population, out-migration of the 15–19 age group was relatively high between 1940 and 1950, but total net migration between 1940 and 1950 and the 1950–60 replacement ratio for men aged 25–69 years were low. There are relatively few nonagricultural employment opportunities in this region and in general it is characterized by small-scale owner-operated farms on

which hired farm labor is important only in the southern part, where farming operations are more extensive.

These characteristics in Region IV usually result in an inverse relationship between the level of farm wages and the various supply and demand factors: The greater the level of net out-migration, the higher the wage rate; the greater the proportion of commercial farms, the lower the wage rate; the higher the value of products sold, the lower the wage rate; and so on. The highest average hourly wage in Region IV in 1950 was in Michigan SEA 1, the "copper country" at the western end of the upper peninsula. The farms in this area are relatively small and the proportion of subsistence farms is relatively high. Off-farm employment opportunities are usually plentiful in mining and lumbering industries. The lowest average hourly wage rates in Region IV in 1950 were in the central Wisconsin areas in which dairying is the predominant farm enterprise and alternative employment opportunities are comparatively few.

The Eastern Great Lakes and Northeast Upland (Economic Region II) also comprise a region primarily of dairy farming, with some specialized areas such as the potato growing areas in Maine, and fruit, truck, and mixed farming on the southern shore of Lake Ontario. In this region, however, there is a larger proportion of Economic Class I and II farms, alternative employment opportunities are greater, and out-migration and replacement ratios for the rural-farm population are relatively low. Some tendency for farm wages to be high is indicated in State economic areas where the proportion of Economic Class I and II farms was relatively high, and a stronger tendency for wages to be low where the value of livestock was high. No significant relationship was found between the level of farm wages and changes in population, nonagricultural employment, or level-of-living indexes.

In the Lower Great Lakes region dairy farming is accompanied by fruit, truck, and mixed farming, principally on the eastern shore of Lake Michigan. Here, however, the proportion of commercial farms, including Economic Class I and II farms, is relatively low and farming operations are generally on a small scale. The proportion of nonagricultural employment among the rural-farm population is higher than in any other economic region, and net out-migration of the rural-farm population was comparatively low. There was some tendency for farm wages to be low in State economic areas where net out-migration of the younger rural-farm population was relatively high (table 11). But wage levels were more strongly associated with the 1950-60 replacement ratio for men aged 25-69, being lower in areas where this replacement ratio was high.

Although high farm wages were associated with high capital investment and value of production, stronger positive associations were found between (1) the composite wage rate and farm operators' family level of living and (2) the proportion of livestock and livestock products in total value of production. In all of these dairy regions a highly significant tendency for farm wages to be lower was indicated in areas where livestock and livestock products constituted a high proportion of sales. Thus it appears that dairy farms pay lower wages; but dairy farms often hire workers by the month at a rate which works out to a comparatively low hourly rate, though room and board or house and other perquisites are added. The value of

TABLE 11.—*Significant correlations between composite hourly cash farm wage rate and selected factors, 1950*

Economic regions	Composite hourly wage rate	Factors associated with the supply of farm labor					Factors associated with the demand for farm labor	
		Population changes			Non-agricultural employment		Extent of operations	
		Total net migration	Ages 15–19 net migration	Replacement ratio of men aged 25–69	Percentage non-agricultural employment	Percentage operators w/100+ days off-farm work	Percentage Econ. Class I & II farms	Percentage farms with tractors
	Cents	*Correlation coefficients*						
United States	52							
VIII Southeast Coastal Plain	35	−.599***			.584***	.492***		
VII Central and Eastern Upland	43				.359*	.429**	.202*	
X South Center and Southwest Plains	44			−.424*			.383*	.740***
IV Upper Great Lakes	44	.740**	.700**	−.680**	.855***	.861***		−.605*
IX Atlantic Flatwoods and Gulf Coast	48			−.800***		.542*		
II Eastern Great Lakes and Northeast Upland	53						.440*	
V North Center (Corn Belt)	53							.294*
III Lower Great Lakes	54		−.452*	−.652***			.515*	.580**
VI Central Plains	60							
I Atlantic Metropolitan Belt	61			−.726***	.550*		.555**	
XI Rocky Mountain and Intermountain	64	−.444*					−.450*	.414*
XII Pacific Northwest	81							
XIII Pacific Southwest	81			−.806**				

Only statistically significant correlations are listed: ***—significant at the .001 level; **—significant at the .01 level; *—significant at the .05 level.

TABLE 11.—*Significant correlations between composite hourly cash farm wage rate and selected factors, 1950*—Continued

Economic regions	Composite hourly wage rate	Factors associated with the demand for farm labor						Farm-operator family level-of-living indexes		
		Percentage commercial farms	Average size of farm	Ability-to-pay		Livestock		1940	1950	Percent change 1940–1950
				Value land and buildings	Value products sold	Value livestock per farm	Percentage livestock is of sales			
	Cents	*Correlation coefficients*								
United States	52									
VIII Southeast Coastal Plain	35	−.403**	−.386**					.420**	.342*	−.324*
VII Central and Eastern Upland	43						.338*			
X South Center and Southwest Plains	44		.728***	.660***	.420*	.750***	.552**	.846***	.829***	−.700***
IV Upper Great Lakes	44	−.888***			−.577*	−.703**	−.853***	−.505*	−.612*	.539*
IX Atlantic Flatwoods and Gulf Coast	48									
II Eastern Great Lakes and Northeast Upland	53					−.690***	−.732***			
V North Center (Corn Belt)	53									
III Lower Great Lakes	54			.628**	.551**		−.721***	.676***	.707***	−.571**
VI Central Plains	60			.352*				.563***	.553***	
I Atlantic Metropolitan Belt	61		−.719***	.519*	.604**			.810***	.745***	−.661***
XI Rocky Mountain and Intermountain	64		−.603**	−.539**	−.473*	−.556**				
XII Pacific Northwest	81									
XIII Pacific Southwest	81		−.786**			−.635*				

Only statistically significant correlations are listed: ***—significant at the .001 level; **—significant at the .01 level; *—significant at the .05 level.

TABLE 12.—*Regression coefficients of composite hourly cash farm wage rates on selected factors for 13 economic regions, 1950*

Economic Region	X_2	X_3	X_4	X_5	X_6	X_7	X_8	X_9	X_{10}	X_{11}	X_{12}	X_{13}	X_{14}	X_{15}	X_{16}	X_{17}
I	−. 159	−. 248	. 816	. 195	. 378	−. 148	. 017	. 812	. 519	−5. 549	−. 216	−. 003	. 951	1. 149	−. 696	−1. 035
II	. 065	. 252	. 311	. 262	. 455	−. 091	−. 210	. 504	. 312	−. 977	−1. 431	−. 338	. 749	. 679	−. 455	−. 077
III	−. 339	−. 643	−. 058	−. 088	. 435	. 269	. 198	. 750	. 520	−3. 000	. 349	−. 342	. 744	. 867	−. 938	−. 958
IV	1. 229	. 614	. 772	. 829	−. 472	−. 590	−. 536	−. 475	−. 607	−1. 125	−1. 140	−. 857	−. 595	−. 715	. 634	−. 969
V	−. 223	−. 032	. 086	. 093	. 062	. 146	. 006	. 022	. 054	. 190	−. 141	−. 112	. 228	. 236	−. 239	−. 091
VI	. 135	. 133	. 226	. 177	. 115	. 026	−. 012	. 123	. 089	−. 126	−. 124	−. 103	. 715	. 553	−. 195	−. 168
VII	−. 170	. 251	. 208	. 348	. 259	. 075	−. 084	. 852	. 245	. 213	. 223	. 164	. 250	. 223	−. 067	−. 149
VIII	−. 568	−. 219	. 270	. 330	. 293	. 111	−. 143	−. 987	−. 438	−1. 385	−1. 824	. 100	. 573	. 433	−. 086	−. 154
IX	−. 176	−. 073	. 423	. 745	. 043	−. 092	−. 061	. 165	. 136	. 194	. 061	. 055	. 804	. 386	−. 285	−. 611
X	−. 020	. 130	. 201	. 264	. 359	. 297	. 059	. 329	. 263	1. 251	1. 302	. 206	. 892	. 761	−. 241	−. 312
XI	−. 503	. 137	. 341	. 333	−. 247	. 336	. 020	−. 411	−. 245	−. 286	−. 210	−. 115	. 134	. 104	−. 064	−. 191
XII	−. 202	−. 372	. 024	. 001	−. 014	−. 002	. 012	. 045	. 028	. 039	. 268	. 028	. 131	. 053	−. 118	−. 036
XIII	−. 348	. 118	. 455	. 272	−. 342	. 307	. 524	−. 933	−. 262	−. 500	−. 706	. 198	. 827	. 375	−1. 069	−. 687

For identification of factors, see table 8.

these perquisites are not included in the computation of the composite hourly wage rate. (See Appendix B.)

The Atlantic Metropolitan Belt (Economic Region I) ranks next to the Lower Great Lakes region in the proportion of rural-farm population engaged in nonagricultural or off-farm work. While the proportion of commercial farms here is low, the proportion of Economic Class I and II farms is high. Farming operations in this region consist largely of dairy, truck, or mixed farming, and capital investment and value of production are relatively high. Among the rural-farm population, 1940–50 net migration and 1950–60 replacement ratios were relatively low (fig. 3). But farm wages showed a tendency to decline with increases in the 1950–60 replacement ratio for men aged 25–69, and to rise with increases in the proportion of nonagricultural employment. Wages also tended to be higher where the proportion of Economic Class I and II farms was high, and where the value of land and buildings, the value of products sold, and farm-operator family level-of-living indexes were high. On the other hand, there was a stronger inverse relationship between farm wages and size of farm (in acres) in this region (table 11). Dairy farms make up a substantial part of the large acreages in this region and truck farms dominate the medium- and small-size groups. The relatively low monthly cash wage rates on dairy farms tend to pull down the average wage on the larger farms while the smaller truck farms usually pay the relatively high piece and hourly rates.

Regions V and VI have the highest proportion of commercial farms of any part of the country. Region V the North Center Corn Belt, is noted for the production of feed grains and livestock. Region VI, the Central Plains, produces most of the nation's wheat and small grains (fig. 2). Farming in these regions is done on a large scale with high capital investment and high average value of production. Nonagricultural and off-farm employment among the rural-farm population is lower here than anywhere in the country. Net migration from the rural-farm population and the replacement ratio for men aged 25–69 were low in the Corn Belt. In the Central Plains, total net migration from the rural-farm population and the replacement ratio for men aged 25–69 were high, but net out-migration of the 15–19 age group was low.

In Economic Regions V and VI, farming operations are fairly uniform throughout the State economic areas. In the Corn Belt farm wages tended to be higher where the proportion of farms having tractors was high. In the Central Plains, wages were higher where value of land and buildings was high and where the farm-operator family level-of-living index was high. These were the only statistically significant relationships observed in these regions between the level of wages and the selected supply and demand factors, and of these, only the association between wage rates and the farm-operator family level-of-living index in the Central Plains reached the .001 level of significance (table 11).

The Rocky Mountain and Intermountain Region XI is the principal livestock range in the country, with some irrigated areas producing special crops including cotton, vegetables, and sugar beets. Here are found the largest farms, and needless to say, the highest values of livestock per farm. Capital investment and value of production

TABLE 13.—*Region means in composite hourly cash farm wage rates and other selected factors, 361 State economic areas, 1950*

Variable	Unit of measure	All regions	Economic regions												
			I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	XIII
X_1 Composite hourly wage rate.	Cent	52	61	54	54	44	53	60	43	35	48	44	64	81	81
X_2 Rate of net out-migration from the total rural-farm population, 1940–50.	Percent	29	21	20	20	28	26	34	29	35	33	45	30	18	16
X_3 Rate of net out-migration from the 1940 rural-farm population aged 15–19, 1940–50.	Percent	53	45	47	51	54	46	50	58	61	56	68	50	50	36
X_4 Percent of rural-farm population employed in nonagricultural industries, 1950.	Percent	29	47	42	48	22	18	12	35	28	34	22	24	40	29
X_5 Percent of farm operators reporting 100 or more days of off-farm work in 1949.	Percent	25	33	34	37	20	14	13	29	22	34	22	27	38	31
X_6 Average value of land and buildings per farm, 1950.	Thousand dollars.	15. 8	16. 8	9. 6	11. 9	9. 6	22. 5	26. 0	6. 9	5. 4	17. 0	10. 7	27. 4	23. 4	42. 5
X_7 Percent of farms reporting tractors, 1950.	Percent	51	54	56	62	71	75	80	26	21	32	37	56	60	54
X_8 Percent commercial farms comprised of all farms, 1950.	Percent	68	64	63	60	79	87	89	51	62	52	67	72	58	71
X_9 Percent Economic Class I and II farms comprised of all farms, 1950.	Percent	11	18	11	6	4	17	20	2	2	9	7	19	16	26

X_{10}	Average value of products sold per farm, 1950.	Thousand dollars.	4.9	6.5	4.5	3.2	3.4	6.4	7.8	1.7	1.7	5.3	3.2	7.9	5.9	14.7
X_{11}	Average size of farm in acres, 1950.	Acres	240	88	137	96	139	188	876	102	98	269	172	1332	269	515
X_{12}	Average value of livestock per farm, 1950.	Thousand dollars.	2.8	1.8	2.3	1.7	2.8	3.4	5.5	1.2	.7	2.5	1.6	9.0	1.9	4.1
X_{13}	Percent livestock and livestock products are of all products sold, 1950.	Percent	57	64	77	68	84	70	53	68	30	36	37	67	48	38
X_{14}	Farm-operator family level-of-living index, 1940.	U. S. Mean = 100.	83	115	109	109	97	117	92	51	37	52	44	95	114	137
X_{15}	Farm-operator family level-of-living index, 1950.	U. S. Mean = 100.	124	153	151	142	138	160	141	90	76	103	87	135	153	182
X_{16}	Percentage change in farm-operator family level-of-living indexes, 1940–50.	Percent	68	38	38	31	46	39	56	96	116	104	124	43	34	33
X_{17}	Replacement ratio for rural-farm men in working age group, 25–69, 1950–60.	Percent	134	114	118	117	119	118	142	137	176	152	137	143	98	117

are also relatively high. Nonagricultural employment is relatively low but there is a high proportion of farm operators who work 100 or more days off the farm. As in the Central Plains, total net out-migration from the rural-farm population and the replacement ratio for men in the working age group were high, but net migration of the 15–19 age group was low (fig. 3). Here, however, the farm wage level appears to be significantly associated with the level of total net migration, being lower in State economic areas where out-migration is higher. There was a slight tendency for farm wages to be higher where the proportion of tractor ownership was high. The relationship between the composite wage rate and most of the other labor demand factors was negative. Lower farm wage rates were associated with higher proportions of Economic Class I and II farms, higher values of land and buildings, higher values of products sold, larger farms, and higher value of livestock per farm. The large stock ranches appear to have lower average wage rates than the smaller vegetable, sugar beet, and general farms in the region. But none of these associations reached the .001 level of statistical significance (table 11).

In the high-wage Pacific Northwest region no significant associations between the composite wage rate and any of the other factors were observed. Much of the territory in this region is nonfarm area. A specialized wheat growing area is in the northern part of the region, and there also are some dairy, poultry, and mixed farming areas, and some of fruit and mixed farming. The proportion of commercial farms is small, but the proportion of Economic Class I and II farms is large. Farming is done on a large scale, with big acreages, high capital investment, and high value of production. Among the rural-farm population, nonagricultural employment was relatively high. Rates of net out-migration and replacement of men aged 25–69 were comparatively low (fig. 3).

The Pacific Southwest is noted for its fruit, truck, and mixed farming areas, but it also contains some areas that specialize in small grains, irrigated cotton, dairying, and extensive range livestock operations. Net out-migration and replacement ratios were very low among the rural-farm population in this region. Nonagricultural employment was near the national average, and a comparatively large number of farm operators did 100 or more days of off-farm work. Farming is done on a large scale, with large farms, high capital investment and high value of production.

In this high wage region, farm wages were higher where the 1950–60 replacement ratio for men aged 25–69 was low among the rural-farm population. Wages were lower in State economic areas having high average values of livestock per farm; and wages were lower on large farms, as in the Rocky Mountain and Intermountain region.

CONCLUSIONS AND IMPLICATIONS

This analysis has demonstrated the wide regional disparity in cash farm wage rates and the complexity of factors that influence these differences. Not only do farm wages vary greatly from one locality to another, as has been indicated by wage statistics for many years, but it is evident that sharp variations exist in the characteristics of factors underlying these local and regional differentials. In some

areas, population variables and other elements of labor supply were found to be closely associated with variations in cash farm wage rates. In others, aspects of the demand for farm labor appeared to be more closely linked to the level of farm wage rates. In some of the economic regions studied, none, or very few, of the selected variables appeared to be significantly related to variations in cash farm wage rates. Whether the lack of statistical association in these economic regions can be attributed to local peculiarities, statistical variation, or other reasons is not clear. Perhaps the seasonal variation, which accounted for about half of the increase in farm wages between the spring of 1950 and the fall of 1954, has contributed substantially to the regional pattern of significant associations produced by the analysis. As we have seen, the fall farm wage picture varies regionally from the spring wage pattern. An analysis of the relationship between fall rates and factors of labor demand and supply might provide widely different results.

Since the cash wage rates reported for April largely represent wages of regular and relatively long-term farm workers, the chances are good that the long-run effects of rural migration and underemployment have greater influence on April than on fall wage rates. The fall rates reflect the wages of many short-term seasonal farm workers as contrasted with those of regular long-time workers in April. In April 1954, fewer than a fifth of all farm workers were nonfarm residents.[22] We can assume that the figure would be much higher during the fall harvest season. Most of these workers are youths, housewives, and elderly persons who are drawn into the labor force only during periods of heavy demand for labor. It is likely that the wages of seasonal farm workers and regular farm workers are influenced by a common set of factors of labor demand, such as scale of operations and value of products sold. Yet it is probable that, in periods of peak demand for farm labor, conditions of labor supply in nonfarm labor markets—the source of much seasonal farm labor—overshadow the effects of underemployment, alternative job opportunities, and other aspects of rural labor supply on the level of farm wage rates.

This study has shown that the movements of farm wage rates and extent of alternative employment opportunities generally coincide throughout the country. Despite the substantial gains in farm wage levels during recent years, farm wage rates are not competitive with industrial wage scales. When industrial jobs are available nearby, rural residents are attracted away from farm jobs and fewer nonfarm residents are likely to seek farm employment.

The nature of the relationship between farm wage rates and rural underemployment appears to vary regionally. In areas close to nonfarm sources of employment, farm wage rates are much more sensitive to changes in the supply of farm labor than they are in predominantly rural areas. However, this relationship is sometimes modified by special conditions of labor demand: In regions in which the requirements for hired labor rise steeply for relatively short periods, farm wage rates also are sensitive to changes in the level of rural underemployment.

[22] Computed from data in FARM POPULATION. Series Census-AMS, P-27, No. 20, 1954, and from ANNUAL REPORT ON THE LABOR FORCE 1954. Bureau of the Census, Current Population Series P-50, No. 59.

There can be no doubt that hired farm workers as a group are near the bottom of the income pyramid in the United States. It is far less clear what can and should be done about it. The character of American agriculture, particularly in the South, is undergoing swift and dramatic change. Policies that appear to offer solutions to today's problems may be ineffectual under tomorrow's conditions. The marginal character of a substantial part of the hired farm work force makes it particularly difficult to shape a clear-cut policy with respect to farm labor. Strikingly different are the problems of the displaced sharecropper, for example, from those of the high school student working on a farm during summer vacation.

The establishment of the Rural Development Program and other concerted efforts to raise rural levels of living are evidence of the growing concern over the problem of low farm incomes. Farm wages are another aspect of the problem that deserves the attention of all those concerned with the improvement of the agricultural economy and rural living.

TABLE 14.—*Composite hourly cash farm wage rates and number of hired farm workers by economic regions, States and State economic areas, 1950 and 1954*

Area	1950		1954	
	Composite hourly wage rate	Number of hired workers	Composite hourly wage rate	Number of hired workers
	Cents	*Thousands*	*Cents*	*Thousands*
United States	52	1, 525	79	2, 730
Economic regions:				
I Atlantic Metropolitan Belt	60	117	84	157
II Eastern Great Lakes and Northeastern Upland	53	83	88	167
III Lower Great Lakes	57	57	84	103
IV Upper Great Lakes	43	49	75	76
V North Center (Corn Belt)	52	168	81	214
VI Central Plains	61	76	87	157
VII Central and Eastern Upland	41	138	61	160
VIII Southeast Coastal Plain	33	242	49	432
IX Atlantic Flatwoods and Gulf Coast	48	154	64	133
X South Center and Southwest Plains	41	161	60	578
XI Rocky Mountain and Intermountain	62	69	78	161
XII Pacific Northwest	82	40	108	76
XIII Pacific Southwest	84	171	100	316
States and State economic areas:				
Alabama	32	37	48	69
Area 1	29	6	40	14
Area 2	37	2	50	9
Areas 3 and 4	41	2	60	6

TABLE 14.—*Composite hourly cash farm wage rates and number of hired farm workers by economic regions, States and State economic areas, 1950 and 1954*—Continued

Area	1950		1954	
	Composite hourly wage rate	Number of hired workers	Composite hourly wage rate	Number of hired workers
States and State economic areas—Continued				
Alabama—Continued	*Cents*	*Thousands*	*Cents*	*Thousands*
Areas 4 and B	29	2	43	3
Area 5	31	5	43	9
Areas 6 and C	30	9	40	11
Area 7a	29	7	47	13
Area 7b	41	1	48	1
Areas 8 and D	47	3	64	3
Arizona	68	16	79	48
Area 1	61	1	83	1
Area A	70	8	81	14
Area 2a	68	5	76	25
Area 2b	64	2	79	8
Arkansas	38	43	55	149
Area 1a	51	2	66	1
Area 1b	44	1	61	1
Area 2	43	1	63	3
Areas 3 and A	41	3	61	5
Area 4	50	1	66	1
Area 5	34	3	50	5
Area 6	40	2	60	5
Area 7a	38	8	59	47
Area 7b	41	2	53	7
Area 8a	36	15	50	58
Area 8b	35	5	51	16
California	86	161	102	278
Area 1	91	2	115	4
Area 2	88	4	103	10
Areas A and B	91	15	103	35
Area 3	82	14	101	17
Areas 4 and C	89	13	113	26
Areas 5 and D	90	18	107	38
Areas 6 and E	83	39	101	80
Areas 7, F, G and H	92	34	106	43
Area 8	74	19	90	21
Area 9	79	3	103	4
Colorado	64	19	87	36
Area 1	56	2	86	3
Area 2a	61	2	86	6
Area 2b	58	2	86	10
Area 3	68	5	89	6
Areas 4 and A	71	4	92	5
Area 5	60	4	77	6
Connecticut	73	11	97	13
Areas 1 and A	70	3	89	2
Areas B and C	79	5	99	8
Area 2	69	3	98	3
Delaware	59	4	84	6
Areas 1 and A	59	4	84	6

TABLE 14.—*Composite hourly cash farm wage rates and number of hired farm workers by economic regions, States and State economic areas, 1950 and 1954*—Continued

Area	1950		1954	
	Composite hourly wage rate	Number of hired workers	Composite hourly wage rate	Number of hired workers
States and State economic areas—Continued	*Cents*	*Thousands*	*Cents*	*Thousands*
Florida	57	66	74	48
Area 1	42	1	65	2
Areas 2 and A	60	4	77	2
Area 3	35	15	51	10
Area 4	67	4	81	4
Areas 5 and B	64	21	80	16
Areas 6 and C	62	21	81	14
Georgia	32	63	48	63
Areas 1 and A	30	2	56	4
Area 2	49	1	62	1
Areas 3 and B	43	3	62	4
Area 4a	32	7	47	7
Area 4b	36	4	51	4
Areas 5, C and D	31	4	48	3
Area 6	30	7	43	10
Area 7a	25	6	37	8
Area 7b	30	13	42	12
Area 8	32	13	46	9
Areas 9 and E	41	3	59	1
Idaho	73	12	102	29
Area 1	65	2	95	3
Area 2	67	1	109	1
Area 3a	73	3	95	7
Area 3b	71	3	99	6
Area 4	79	3	108	12
Illinois	53	49	82	54
Areas 1, A and B	56	5	86	7
Areas 2 and C	66	7	92	8
Area 3	50	6	83	7
Area 4	49	5	74	5
Area 5	56	2	96	3
Areas 6a, D and E	55	6	81	6
Area 6b	51	9	81	9
Areas 7 and F	46	3	74	3
Area 8	50	1	72	1
Area 9	47	2	68	2
Area 10	50	1	72	1
Area 11	46	2	65	2
Indiana	53	27	81	37
Areas 1, A and B	64	2	83	3
Area 2a	65	3	90	4
Area 2b	52	4	84	6
Areas 3 and C	51	2	87	3
Area 4	59	3	85	5
Areas 5 and D	51	5	80	6
Areas 6 and E	51	4	72	5
Area 7	45	2	72	3
Areas 8 and F	44	2	70	2

TABLE 14.—*Composite hourly cash farm wage rates and number of hired farm workers by economic regions, States and State economic areas, 1950 and 1954*—Continued

Area	1950		1954	
	Composite hourly wage rate	Number of hired workers	Composite hourly wage rate	Number of hired workers
States and State economic areas—Continued	*Cents*	*Thousands*	*Cents*	*Thousands*
Iowa	53	39	82	48
Area 1a	52	4	83	5
Areas 1b, A and B	56	6	83	6
Area 2a	50	2	81	3
Areas 2b and C	56	6	85	8
Area 3a	51	2	84	3
Area 3b	51	2	74	2
Area 4	50	6	77	8
Area 5	54	5	86	6
Areas 6 and D	53	6	84	7
Kansas	62	18	91	27
Area 1	67	3	90	4
Area 2a	65	3	97	5
Area 2b	67	1	97	2
Areas 3a and A	64	2	92	3
Area 3b	71	1	92	1
Area 4	56	1	90	2
Area 5	62	2	85	3
Areas 6 and B	56	3	89	4
Area 7a	58	1	85	2
Area 7b	57	1	82	1
Kentucky	39	43	62	58
Area 1	39	2	68	4
Area 2	36	2	51	2
Area 3a	33	3	53	3
Area 3b	31	2	53	3
Area 4	30	5	48	5
Area 5	33	4	47	5
Areas 6, A and B	40	13	67	20
Area 7	54	7	75	10
Areas 8 and C	38	3	54	5
Area 9	44	2	56	1
Louisiana	38	42	55	108
Area 1 and A	34	5	53	19
Area 2	35	6	47	27
Area 3	37	3	56	25
Area 4	36	1	71	5
Areas 5 and B	50	9	58	6
Area 6	37	13	55	16
Area 7	42	4	62	8
Area 8	40	1	66	2
Maine	67	9	93	46
Area 1	75	4	111	35
Area 2	59	2	85	5
Area 3	61	1	91	2
Areas 4 and A	62	2	84	4
Maryland	49	21	73	22
Area 1	47	(1)	74	1
Area 2	46	6	69	6

[1] Less than 500.

TABLE 14.—*Composite hourly cash farm wage rates and number of hired farm workers by economic regions, States and State economic areas, 1950 and 1954*—Continued

Area	1950		1954	
	Composite hourly wage rate	Number of hired workers	Composite hourly wage rate	Number of hired workers
States and State economic areas—Continued				
Maryland—Continued	*Cents*	*Thousands*	*Cents*	*Thousands*
Areas A and B	54	5	84	6
Area 3	45	2	64	1
Area 4a	47	4	69	4
Area 4b	55	4	74	4
Massachusetts	66	13	99	20
Area 1	62	1	91	2
Area A	73	2	97	3
Area B	64	2	93	3
Area C	75	5	99	6
Areas 2, D and E	74	3	108	6
Michigan	57	23	86	64
Area 1	60	(1)	95	2
Area 2	47	1	88	1
Area 3	57	1	86	5
Area 4a	51	1	82	6
Area 4b	52	1	78	2
Areas 5a and A	59	2	88	6
Area 5b	49	1	82	3
Areas 6a, B and C	58	2	89	7
Area 6b	63	3	77	13
Areas 7, D and E	53	4	81	7
Areas 8 and F	60	4	89	7
Area 9a	48	1	89	2
Areas 9b and G	62	2	86	3
Minnesota	49	30	83	51
Area 1	63	3	101	14
Areas 2 and A	54	1	84	2
Area 3	39	2	75	3
Area 4	40	2	73	3
Area 5	46	3	73	5
Areas 6 and B	46	10	77	12
Area 7	52	5	79	7
Area 8	51	4	77	5
Mississippi	34	55	52	120
Area 1	34	31	47	52
Area 2	35	8	45	25
Areas 3 and A	34	4	53	10
Area 4	37	2	54	8
Area 5	29	4	53	9
Area 6a	36	3	55	10
Area 6b	34	2	52	3
Area 7	40	1	67	2
Area 8	56	(1)	69	1
Missouri	46	33	73	58
Areas 1 and A	53	6	78	5
Area 2a	49	3	72	3
Area 2b	46	4	69	5
Area 3	46	2	72	2

[1] Less than 500.

TABLE 14.—*Composite hourly cash farm wage rates and number of hired farm workers by economic regions, States and State economic areas, 1950 and 1954*—Continued

Area	1950		1954	
	Composite hourly wage rate	Number of hired workers	Composite hourly wage rate	Number of hired workers
States and State economic areas—Continued				
Missouri—Continued	*Cents*	*Thousands*	*Cents*	*Thousands*
Area 4	53	1	73	1
Area 5	46	2	69	1
Areas 6 and B	46	4	72	3
Area 7	49	3	67	2
Area 8	46	1	63	1
Area 9a	38	2	59	6
Area 9b	39	5	57	29
Montana	60	12	84	17
Area 1a	61	1	92	1
Area 1b	62	3	82	4
Area 2a	56	2	87	3
Area 2b	62	3	87	5
Area 3a	63	1	78	2
Area 3b	59	2	74	2
Nebraska	56	16	86	26
Area 1	52	3	80	4
Area 2	63	2	96	6
Area 3a	55	2	82	4
Area 3b	51	2	76	3
Area 4	62	2	89	2
Area 5	65	1	89	2
Area 6	50	2	78	2
Areas 7, A and B	55	2	89	3
Nevada	63	3	86	3
Area 1	63	3	86	3
New Hampshire	64	5	86	5
Area 1	59	2	87	2
Areas 2 and A	67	3	86	3
New Jersey	67	23	86	35
Areas 1, A, B and C	68	12	91	15
Areas 2, D, E and F	65	11	83	20
New Mexico	52	12	67	36
Area 1a	60	1	71	2
Area 1b	52	1	64	2
Area 2	53	3	70	6
Area 3	50	7	62	26
New York	55	52	87	94
Areas 1, A and B	63	7	89	21
Area 2	54	4	84	9
Area 3a	49	3	87	9
Area 3b	54	3	90	6
Areas 4 and C	51	5	85	7
Areas 5 and D	45	3	74	4
Areas 6 and E	46	5	65	4
Area 7	43	6	74	7
Areas 8 and F	52	3	77	3
Area 9	57	8	91	15
Area G	80	5	104	9

TABLE 14.—*Composite hourly cash farm wage rates and number of hired farm workers by economic regions, States and State economic areas, 1950 and 1954*—Continued

Area	1950		1954	
	Composite hourly wage rate	Number of hired workers	Composite hourly wage rate	Number of hired workers
States and State economic areas—Continued	*Cents*	*Thousands*	*Cents*	*Thousands*
North Carolina	40	52	56	91
Areas 1 and A	49	4	60	3
Area 2	65	1	73	1
Areas 3, B and C	47	5	63	6
Area 4a	37	1	61	2
Area 4b	52	2	64	2
Areas 5 and D	39	4	57	4
Areas 6 and E	39	5	54	13
Area 7	31	6	53	18
Area 8	34	8	57	16
Area 9	35	4	50	8
Area 10	42	3	56	4
Area 11	38	9	53	14
North Dakota	56	11	87	33
Area 1	54	2	73	3
Area 2a	67	1	89	2
Area 2b	50	1	75	2
Area 3a	56	2	77	6
Area 3b	49	2	73	4
Area 3c	47	1	72	2
Area 4	64	2	102	14
Ohio	55	35	86	48
Areas 1 and A	59	3	92	6
Area 2	56	3	87	4
Areas 3, B, C and D	54	9	87	11
Areas 4a and E	74	3	92	4
Area 4b	47	2	76	3
Areas 5, F, G and H	61	4	93	7
Area 6a	53	2	89	3
Areas 6b and J	43	2	78	3
Areas 7 and K	48	3	82	3
Areas 8a and L	44	2	64	2
Area 8b	43	2	62	2
Oklahoma	55	18	78	63
Area 1	67	2	91	5
Area 2	69	2	92	4
Areas 3 and A	56	2	76	4
Area 4	61	3	81	28
Areas 5 and B	57	3	80	6
Area 6	43	1	62	2
Area 7a	48	1	76	3
Area 7b	41	1	60	4
Area 8a	42	1	58	4
Area 8b	39	1	64	(1)
Area 9	42	1	58	3
Oregon	79	20	105	38
Area 1a	77	1	105	2
Area 1b	82	2	109	2
Areas 2a and A	80	8	102	20

[1] Less than 500.

TABLE 14.—*Composite hourly cash farm wage rates and number of hired farm workers by economic regions, States and State economic areas, 1950 and 1954*—Continued

Area	1950		1954	
	Composite hourly wage rate	Number of hired workers	Composite hourly wage rate	Number of hired workers
States and State economic areas—Continued				
Oregon—Continued	*Cents*	*Thousands*	*Cents*	*Thousands*
Area 2b	84	2	103	4
Area 3	76	2	103	2
Area 4	78	5	107	8
Pennsylvania	52	46	79	72
Areas 1a, A and B	53	3	87	7
Area 1b	49	2	87	3
Area 2	42	4	72	5
Area 3	45	1	71	1
Area 4a	46	1	69	2
Areas 4b and E	48	2	67	3
Areas 5 and F	44	4	68	5
Areas 6, G and C	48	4	72	8
Areas 7 and H	50	4	77	9
Area D	50	3	80	4
Areas J and K	49	5	80	8
Areas L, M and N	60	13	87	17
Rhode Island	68	2	97	1
Areas 1 and A	68	2	97	1
South Carolina	30	44	43	58
Area 1	46	1	51	1
Area 2	41	5	48	4
Area 3	33	2	44	2
Area 4	30	3	42	3
Areas 5, A and B	32	4	60	3
Area 6	24	17	37	29
Area 7	26	6	38	11
Areas 8 and C	35	6	52	5
South Dakota	54	11	79	18
Area 1	54	3	75	4
Area 2a	53	1	76	2
Area 2b	56	2	82	4
Area 3a	52	1	74	1
Area 3b	52	1	81	2
Area 4a	50	1	82	2
Area 4b	55	2	80	3
Tennessee	33	45	52	100
Areas 1 and A	32	13	49	57
Area 2	36	2	61	11
Area 3	36	2	51	4
Area 4	37	3	50	3
Areas 5 and B	31	9	44	7
Area 6	30	3	47	5
Area 7	37	1	55	2
Areas 8a, C and D	40	5	55	5
Area 8b	30	7	46	6
Texas	44	146	62	346
Areas 1a and A	46	7	54	35
Area 1b	42	4	54	5
Area 2	57	4	70	6

TABLE 14.—*Composite hourly cash farm wage rates and number of hired farm workers by economic regions, States and State economic areas, 1950 and 1954*—Continued

Area	1950		1954	
	Composite hourly wage rate	Number of hired workers	Composite hourly wage rate	Number of hired workers
States and State economic areas—Continued				
Texas—Continued	*Cents*	*Thousands*	*Cents*	*Thousands*
Area 3	40	10	51	9
Area 4	61	5	81	20
Area 5	52	7	73	54
Area 6a	56	9	74	42
Area 6b	59	1	80	2
Area 7a	59	2	73	3
Areas 7b and B	58	3	76	6
Area 7c	52	2	71	2
Areas 8, C, D and E	41	19	57	73
Area 9	38	5	57	14
Area 10	45	3	58	6
Areas 11 and F	47	11	59	9
Area 12	45	10	62	22
Area 13	48	1	70	4
Areas 14, G and H	54	10	72	17
Area 15	32	33	47	17
Utah	76	7	93	14
Area 1	75	3	94	3
Areas 2 and A	77	2	88	7
Area 3	74	2	99	4
Vermont	47	8	75	10
Area 1	43	3	65	4
Area 2	50	5	83	6
Virginia	43	44	59	59
Area 1	36	2	45	2
Area 2	38	5	48	4
Areas 3 and A	46	3	63	3
Area 4	47	5	68	8
Areas 5 and B	44	8	60	8
Areas 6 and C	41	5	62	7
Area 7	42	4	58	6
Areas 8 and 9	53	3	70	3
Area 10	35	4	54	10
Areas 11 and D	47	5	58	8
Washington	83	23	117	42
Area 1	82	1	123	1
Area 2	79	2	102	4
Areas 3, A and B	83	3	114	5
Areas 4 and C	81	1	104	2
Area 5a	85	3	116	10
Area 5b	79	(1)	97	1
Area 6	85	8	108	12
Area 7a	86	2	113	3
Areas 7b and D	79	3	108	4
West Virginia	45	12	63	12
Areas 1 and A	47	1	60	1
Areas 2a and B	44	2	56	1
Area 2b	40	2	61	2

(1) Less than 500.

TABLE 14.—*Composite hourly cash farm wage rates and number of hired farm workers by economic regions, States and State economic areas, 1950 and 1954*—Continued

Area	1950		1954	
	Composite hourly wage rate	Number of hired workers	Composite hourly wage rate	Number of hired workers
States and State economic areas—Continued				
West Virginia—Continued	*Cents*	*Thousands*	*Cents*	*Thousands*
Area 3	47	1	64	1
Areas 4 and C	56	1	70	(1)
Area 5	44	3	61	3
Area 6	47	2	71	4
Wisconsin	41	37	73	51
Areas 1 and A	52	2	93	7
Area 2a	38	4	62	5
Area 2b	37	3	66	3
Area 3	39	3	64	3
Area 4	36	3	79	7
Area 5	38	2	73	3
Area 6	37	3	69	4
Area 7	39	5	62	6
Areas 8 and B	44	10	69	10
Areas 9 and C	54	2	89	3
Wyoming	60	7	79	8
Area 1	61	3	72	2
Area 2a	62	2	85	3
Area 2b	57	2	79	3

[1] Less than 500.

Number of hired workers from Censuses of Agriculture, 1950 and 1954.

Composite hourly wage rates computed by Agricultural Marketing Service from data in Censuses of Agriculture, 1950 and 1954.

APPENDIX A. COMPARISON OF FARM WAGE EXPENDITURE AND WAGE RATE DATA IN THE CENSUSES OF AGRICULTURE FOR 1940, 1945, 1950 AND 1954, AND WAGE RATE DATA IN THE AMS FARM WAGE SERIES

Information on farm wage expenditures in the Censuses of Agriculture for 1940, 1945, 1950, and 1954, farm wage rate data in the Censuses of Agriculture for 1950 and 1954, and the farm wage series of the Agricultural Marketing Service differ in several major respects: The definition of hired farm labor, the method of reporting wage information, the geographic area for which wage information is reported, size of sample and method of enumeration, and the date to which the data relate.

The 1940 and 1945 Censuses of Agriculture define hired farm workers as persons 14 years of age and over who worked two or more days at farm wage work during specified weeks which closely approximated the beginning of the enumeration.

The 1950 and 1954 Censuses of Agriculture and the Agricultural Marketing Service define hired farm labor as all persons doing 1 or more hours of farm work or chores for pay during the survey week. Members of the operator's family doing farm work for cash wages are counted as hired workers. Croppers are considered family workers when working on their own crops, but hired workers when doing farm work for pay off their own tracts. If a person is employed both as a family worker and a hired worker during the survey week on the same farm, he is counted as a hired worker. In the AMS farm labor series, wage rates are reported quarterly by the same sample of farm operators that reports employment. The farmer is asked to report average wage rates being paid "at this time" in his locality. "At this time," on the average, probably represents the second or third day before the end of the month.

In 1940 the Census of Agriculture reported the number of workers by the basis on which they were hired during the specified week:(a) By the month, (b) by the day or week, or (c) other (including piecework and contract labor). The 1945 census reported only total number of hired farm workers during the specified week. In both 1940 and 1945 the censuses published the aggregate cash wage bill in the previous year. In addition, number of farms was reported by a breakdown of total wage bill per farm in the previous year.

In 1950 and 1954 the Census of Agriculture reported hired farm workers by basis of payment (monthly, weekly, daily, hourly, piecework), average wage per month, week, day or hour; and average hours per month, week, or day. In 1950 there was an additional breakdown of number of farms by perquisites furnished workers paid on a monthly, weekly, or daily basis, which was not obtained in the Census of Agriculture for 1954. This still varies somewhat from the AMS Farm Labor series which reports "average rates being paid to hired farm labor in the locality" on a monthly, weekly, daily, or hourly basis, with and without board and room, or house.

Gross farm wage expenditures were reported for counties, States, and geographic divisions in the 1940, 1945, 1950, and 1954 agricultural censuses. The 1950 and 1954 censuses reported farm wage rate data by State economic areas, States and geographic divisions. The AMS farm wage rate data is reported for States and geographic divisions.

Agricultural Marketing Service estimates are based on mailed questionnaires received each month from 20,000 to 25,000 farmers who report the number of persons working on their farms during the last complete calendar week, ending at least one day before the end of the month. Wage rates are reported quarterly by the same sample of farm operators. The farmer is asked to report average wage rates being paid "at this time" in his locality. The Census of Agriculture is based on a sample of 20 percent or more of all farm operators.

For the 1940 Census of Agriculture the specified reporting weeks were March 24–30 in 1940 with census date of April 1; and the week ending January 6 in 1945 with census date of January 1. (The average date of enumeration in 1945 was March 16–31.)

For 1950, the Census of Agriculture wage rates and numbers employed related to the week preceding the enumeration. For 43 States, the average date of enumeration was April 15–28; for the remaining 5 States, the average date was April 1–14. For 1954, the

Census of Agriculture wage rates and numbers employed related to a specific week. For 33 States the week was September 26–October 2, while for the other 15 States the week was October 24–30.

APPENDIX B. METHOD OF COMPUTATION OF THE COMPOSITE HOURLY CASH FARM WAGE RATES

The 1950 and 1954 Censuses of Agriculture, Vol. I, Counties and State Economic Areas, Parts 1 to 33, list for each State economic area in the United States the following information on hired farm workers by basis of payment:

Paid on a monthly basis—persons
average hours worked per month
average wage per month (dollars).
Paid on a weekly basis—persons
average hours worked per week
average wage per week (dollars).
Paid on a daily basis—persons
average hours worked per day
average wage per day (dollars).
Paid on an hourly basis—persons
average wage per hour (dollars).
Paid on a piece-work basis—persons.

The composite hourly wage rate was computed as follows:

1. Wage rates other than hourly rates were converted to an hourly equivalent by dividing total wages in basis of payment group by the average hours worked.
2. These hourly-equivalent rates were then weighted by the number of workers in the corresponding basis of payment groups, giving the gross hourly wage bill for each group. The average hourly rate was weighted by the number of piece-rate workers as well as hourly workers to obtain an estimated wage bill for piece workers.
3. These products were then totaled according to the area for which a composite wage rate was desired. For one State economic area, the gross hourly wage bills for all the different bases of payment were summed and then divided by the total number of workers in the area to obtain the composite hourly wage rate. The sums of these products for all State economic areas were added together and then divided by the total number of workers in a State to obtain the composite rate for each State. The same procedure was used to obtain composite hourly wage rates for each economic region.

The composite hourly wage rates computed in this manner represent cash payments only and do not include the value of perquisites furnished in addition to cash wages.

APPENDIX C. DEFINITIONS AND EXPLANATIONS OF SELECTED FACTORS COMPARED WITH COMPOSITE HOURLY CASH FARM WAGE RATES

All of the quantities or values involved in the selected economic and demographic factors that were compared with composite hourly cash farm wage rates were computed for State economic areas. State economic area indexes of actual values of these factors were grouped or averaged to obtain the broader geographic area averages.

X_2 *Rate of net out-migration from the total rural-farm population, 1940–50.*

The estimates of net out-migration of persons from the rural-farm population between 1940 and 1950 relate to persons alive in both 1940 and 1950 and do not include estimates of migration of those born or dying during the decade. Net migration is expressed as a percentage of the expected survivors to 1950 of persons living on rural farms in

1940. (See BOWLES, GLADYS K., FARM POPULATION—NET MIGRATION FROM THE RURAL-FARM POPULATION, 1940–50. Statistical Bulletin No. 176. U. S. Dept. Agr. 1956.) Census forward survival ratios were applied to 1940 sex-age-color groups of 1940 rural-farm population, obtained by summing appropriate county data from the 1940 Census of Population, to obtain the population expected to be alive in 1950. The difference between these estimates of "expected" survivors and the actual rural-farm population aged 10 and over residing in each State economic area in 1950 was obtained. These results were the estimates of net migration, which were then related to the "expected" population.

X_3 *Rate of net out-migration from the 1940 rural-farm population aged 15–19, 1940–50.*

The estimates of net out-migration of persons aged 15–19 from the rural-farm population between 1940 and 1950 relate to persons aged 15–19 in 1940 alive in both 1940 and 1950 and do not include estimates of migration of persons aged 15–19 in 1940 who died during the decade. Net migration of persons aged 15–19 is expressed as a percentage of persons aged 15–19 living on rural farms in 1940 expected to survive and reach ages 25–29 in 1950. The method of computation is the same as that used to obtain total net migration in item X_2.

X_4 *Percent of rural-farm population employed in nonagricultural industries, 1950.*

Number of persons in the rural-farm population employed in nonagricultural industries in 1950 expressed as a percentage of total employed rural-farm population. For State economic areas in 44 States this percentage was computed from unpublished data in the 1950 Census of Population on employment by industry groups among the rural-farm population 14 years old and over, by counties. For State economic areas in Alabama, Iowa, Louisiana, and Virginia, data were used from Vol. II, Chap. B, Table 49 of the 1950 Census of Population showing employment by major occupation groups.

X_5 *Percent of farm operators reporting 100 or more days of off-farm work in 1949.*

Farm operators reporting 100 or more days off-farm work in 1949 expressed as a percentage of total farm operators in 1950. "Off-farm work" means either nonagricultural employment or work on a farm other than the operator's own for cash wages. (1950 Census of Agriculture, Vol. I, Counties and State Economic Areas, Economic Area Table 1, line 7, "Farm operators working off their farms 100 days or more," divided by line 1, "Number of farms.")

X_6 *Average value of land and buildings per farm, 1950.*

Total value of land and buildings divided by the total number of farms. (1950 Census of Agriculture, Vol. I, Counties and State Economic Areas, Economic Area Table 5 (Part 1 of 2), line 12.)

X_7 *Percent of farms reporting tractors, 1950.*

Number of farms having tractors expressed as a percentage of the total number of farms. (1950 Census of Agriculture, Vol. I, Counties and State Economic Areas, Economic Area Table 5 (Part 2 of 2), line 16 divided by line 1.)

X_8 *Percent commercial farms comprised of all farms, 1950.*

Number of commercial farms expressed as a percentage of the total number of farms. Commercial farms are all farms with a value of sales of farm products amounting to $1,200, and farms with a value of sales of $250 to $1,199 if the farm operator worked off the farm less than 100 days, and the income which the farm operator and members of his family received from nonfarm sources was less than the total value of all farm products sold. (1950 Census of Agriculture, Vol. I, Counties and State Economic Areas, Economic Area Table 8 (Part 1 of 2), line 1, Total commercial farms divided by Total, all farms.)

X_9 *Percent Economic Class I and II farms comprised of all farms, 1950.*

Number of farms having value of products sold of $10,000 or more expressed as a percentage of the total number of farms. (1950 Census of Agriculture, Vol. I, Counties and State Economic Areas, Economic Area Table 8 (Part 1 of 2), line 1, Class I plus Class II divided by Total, all farms.)

X_{10} *Average value of products sold per farm, 1950.*

Total value of farm products sold divided by total number of farms. (1950 Census of Agriculture, Vol. I, Counties and State Economic Areas, Economic Area Table 9, line 35 divided by Economic Area Table 1, line 1 for the South; Economic Area Table 9, line 34 divided by line 1, Economic Area Table 1 for other States.)

X_{11} *Average size of farm in acres, 1950.*

Total number of acres in farms divided by the total number of farms. (1950 Census of Agriculture, Vol. I, Counties and State Economic Areas, Economic Area Table 6 (Part 1 of 2), line 9.)

X_{12} *Average value of livestock per farm, 1950.*

Total value of specified classes of livestock (horses, mules, cattle, hogs, sheep, chickens and turkeys) divided by total number of farms. (1950 Census of Agriculture, Vol. I, Counties and State Economic Areas, County Table 4 (Part 1 of 2), line 1 was grouped into State economic areas and divided by Economic Area Table 1, line 1.)

X_{13} *Percent livestock and livestock products are of all products sold, 1950.*

Value of livestock and livestock products sold expressed as a percentage of total value of farm products sold. (1950 Census of Agriculture, Vol. I, Counties and State Economic Areas, Economic Area Table 9, line 41 divided by line 35 for the South; line 40 divided by line 34 for other States.)

$X_{14, 15}$ *Farm-operator family level-of-living indexes, 1940 and 1950.*

Level-of-living indexes for farm operator families by counties are based on the following items: (1) Percentage of farms with electricity; (2) percentage of farms with telephones; (3) percentage of farms with automobiles; and (4) average value of products sold or traded in the preceding calendar year (adjusted for changes in purchasing power of the farmer's dollar). Indexes for State economic areas are simple arithmetic averages of the indexes for the counties in the State economic areas. The County and State economic area level-of-living indexes used in this study, and a description of their computation are found in HAGOOD, MARGARET JARMAN. FARM-OPERATOR FAMILY LEVEL-OF-LIVING INDEXES FOR COUNTIES OF THE UNITED STATES, 1930, 1940, 1945, AND 1950. Bureau of Agricultural Economics, U. S. Dept. Agr., Washington. 1952.

X_{16} *Percentage change in farm-operator family level-of-living indexes, 1940–50.*

Difference between 1940 and 1950 level-of-living indexes expressed as a percentage of the 1940 index.

X_{17} *Replacement ratio for rural-farm men in working age group, 25–69, 1950–60.*

This ratio indicates the number of young men 15–24 in the rural-farm population in 1950 who will be entering the working age group for every 100 older men who will die or retire between 1950 and 1960. The higher this replacement ratio, the greater is the excess of men entering the working age group over the number needed to replace those moving out of this group. (BOWLES, GLADYS K., and TAEUBER, CONRAD. RURAL-FARM MALES ENTERING AND LEAVING WORKING AGES, 1940–50 AND 1950–60—REPLACEMENT RATIOS AND RATES. Series Census–AMS (P–27) No. 22, 65 pp. Washington. 1956.)

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