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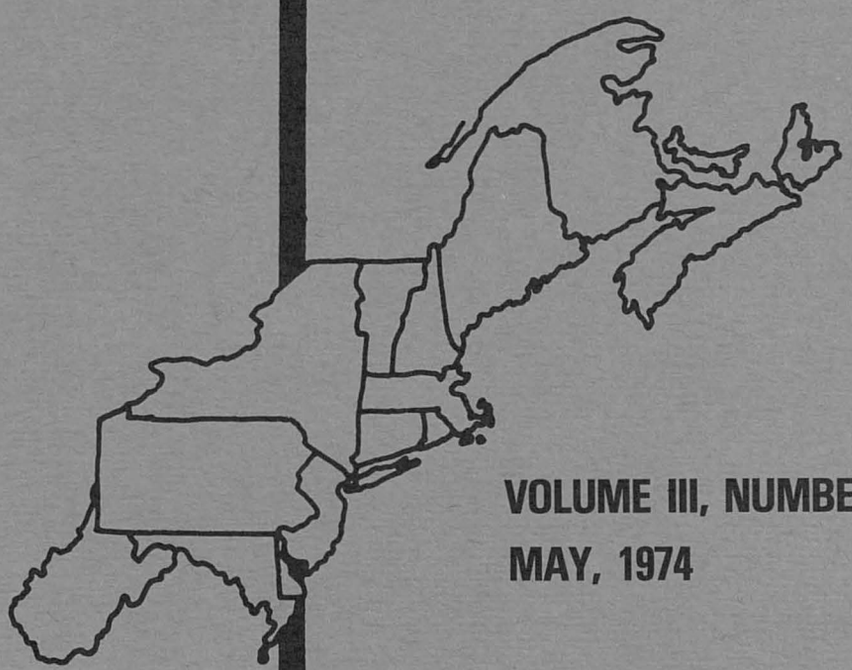

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AN ANALYSIS OF FACTORS AFFECTING THE WORK FORCE STATUS OF LOCAL HIRED FARM WORKERS IN DELAWARE AND WEST VIRGINIA*/

by

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Two general approaches have dominated recent discussions with regard to reducing the incidence of poverty among rural households headed by working age poor. One approach has stressed the need for increasing job opportunities for residents of rural areas [13, p. 114]. The other has stressed the need for increasing the level of investment in human capital to enhance the productivity and employability of people in rural areas [15, p. 120]. While these are basically complementary rather than alternative approaches to reducing the incidence of poverty among the working age poor in rural communities, integrative analyses encompassing both of these approaches have been lacking.

This paper focuses on a sample of local hired farm workers, a group which epitomizes the low income problem in many rural communities Since workers who do farm and nonfarm work have higher earnings on the average than workers who do farm work only, multiple jobholding is consistent with the goals of economic efficiency, upward mobility and reducing the incidence of poverty. The purpose of the paper is to evaluate the effects of local nonfarm employment opportunities and personal characteristics of workers in explaining the differences between workers who do farm work only and those who combine farm and nonfarm employment.

The Model

It is hypothesized that the difference between local farm workers who do farm work only and those who do farm and nonfarm work can be explained by (1) differences in the personal characteristics of workers and (2) differences in the nature of employment opportunities between local rural labor markets. Specifically the following functional relationship is proposed:

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$$Y = f(X_1 \ldots X_6, X_7, \ldots X_{10})$$

where:

Y is a measure of labor force status and is specified in two ways. The first (Y*) is a dichotomization of all workers into (1) those who did farm work only during the survey year, and (2) those who did farm and nonfarm work (1 if farm and nonfarm work; 0 otherwise). Specification of work force status in this way assumes that entry into and exposure to nonfarm employment, regardless of the duration of such employment in any given year, is a significant measure of labor market mobility. The impact of the entry decision must be evaluated over the working life of the individual rather than in terms of the duration of employment in any given year. An alternative specification (Y**) is in terms of the actual weeks of nonfarm employment with those workers who did farm work only assigned a value of zero. This specification assumes that the number of weeks of nonfarm work during the survey year is a significant measure of labor force status. This variable construes labor market success in terms of the staying power in the nonfarm labor market during a given year rather than in terms of successful entry.

The following personal characteristic variables are included in the model:

X_1 is the worker's age;
X_2 is a dummy variable to denote the occupation of the worker's father when the worker was in his teens (0 = hired farm worker or farm operator, 1 = other);
X_3 is the worker's race (0 = black, 1 = white[1/]);
X_4 is the number of years of school completed by the worker;
X_5 is a dummy variable to denote whether the worker has ever used the public employment service (0 = no, 1 = yes); and
X_6 is the number of years during the 5 years immediately preceding the survey year in which the worker's major occupation was nonfarm work.

The variables age, father's occupation, and race are basic demographic characteristics which are hypothesized to affect work force status. The inverse relationship between age and occupational mobility is well-documented in mobility research [8, 12]. As a worker becomes older, he finds it more difficult to obtain and adjust to new employment. At the same time, the number of years over which he benefits from a job change declines with age.

1/ No other ethnic groups were contained in the sample of local workers, although Puerto Ricans, Texas Mexicans and British West Indians constituted part of the interstate work force.

Previous research results indicate that the level of occupational achievement is lower among farm-reared men than among men reared in small towns and lower still than that of men reared in urban areas [7]. Consistent with these findings, it is posited that a worker is less likely to do nonfarm work if his father was a hired farm worker or farm operator, other things being equal.

Two factors are important in assessing the effect of race on work force status. On the one hand, black workers as a group have fared less well in and have lower expectations from agriculture, and therefore have a higher propensity to move. On the other hand, they are likely to face greater entry barriers in most segments of the nonfarm work force than white workers. However, previous research has shown that the forces which push blacks out of agriculture outweigh the forces that tend to block them in, i.e., the farm-nonfarm mobility rates for blacks exceed those for whites [8].

The positive influence of education on earnings and mobility is also substantiated by previous research. Gisser estimated that an increase in the level of schooling by 10 percent in rural areas would result in a 6-7 percent increase in farm outmigration [5]. Education is probably the most frequently used index by which nonfarm employers evaluate the suitability of hired farm workers for nonfarm employment.

Results of research by Rees and Schultz indicate that the predominant source of job information among unskilled and semiskilled workers in an urban labor market was friends and relatives [14]. Visits to the local employment office represent another source of job information. It is posited that workers who use the local employment office invest significantly more in the search process than workers who do not. On the average, this investment in search results in a net positive private rate of return concomitant with nonfarm employment.

Finally, Mincer's findings indicate that on-the-job training represents a significant proportion of the total stock of human capital and is relevant in explaining variation in earnings and employment [10]. In this analysis, years of nonfarm work is construed as on-the-job training for nonfarm jobs. The more years of nonfarm work experience a worker has accumulated the greater is the likelihood that he will prevail in the nonfarm work force.

In addition to the above personal characteristic variables, the work force status of local hired farm workers depends upon local labor market conditions. Galloway's findings indicate that the labor market on an aggregate level operates efficiently in allocating workers between occupations to meet changing labor market demands over time [4]. Within a local labor market a worker is more likely to move into nonfarm occupations if the nonfarm labor market is characterized by rapid growth in employment. Creation of new jobs in the local labor market creates more local job alternatives for hired farm workers, other things being equal.

Galloway's findings also indicate that when workers move between occupations they are quite responsive to differential economic advantages [4]. Accordingly it is posited that as the economic differential between hired farm work and alternative nonfarm occupations increases, the probability that hired farm workers will enter nonfarm occupations also increases.

The likelihood of a worker doing nonfarm work also depends upon the supply and demand conditions in the local labor market at a point in time as reflected by the unemployment rate. The unemployment rate in a local labor market is affected by the level of economic activity in the area as well as by patterns of geographic migration resulting from changes in the labor demand situation in the local labor market. With regard to the latter point, Somers' findings in a case study show that the unemployment rate in a local rural labor market was left unchanged by the establishment of a large new plant in the area because of the resultant in-migration [16].

Finally, the likelihood of a worker doing nonfarm work depends upon the size of the farm labor force relative to nonfarm employment opportunities. It is posited that the smaller the farm labor force relative to total employment in a local labor market the greater is the likelihood that farm workers will find nonfarm employment.

To capture the effect of variation in local labor market conditions, the following variables are included in the model:

X_7 is the percentage change in employment in the worker's local labor market between 1960 and 1970

$$\left[\frac{\#\text{ employed 1970} - \#\text{ employed 1960}}{\#\text{ employed 1960}} \cdot 100\right];$$

X_8 is the difference between the 1970 weighted average of the median income for the four occupations (craftsman, foreman and kindred workers, operatives, laborers except farm, and service workers) and the median income of farm laborers and foreman in the worker's local labor market;

X_9 is the aggregate unemployment rate in the worker's local labor market

$$\left[\frac{\text{employed}}{\text{employed} + \text{unemployed}} \cdot 100\right] \text{2/}; \text{ and}$$

2/ The reference period for this variable is the last week of March 1970. A reviewer has pointed out that the extent of nonfarm work depends upon the availability of nonfarm employment during slack periods of farm employment, and that the appropriate reference period might vary by area depending on the patterns of agricultural employment. We basically agree with this argument but existing employment and unemployment data are not available in sufficient detail to construct such variables for the labor market area that we specified.

X_{10} is

$$\left[\frac{\text{farm foreman and laborers employed}}{\text{total labor force employment}} \cdot 100\right]$$

in the worker's local labor market.3/

The Data

The data for the personal characteristic variables were obtained from statewide surveys of hired farm workers in Delaware and West Virginia conducted during the summer of 1970. The survey was conducted in conjunction with the Northeast Project (NE-58) designed to evaluate the impact of extending unemployment insurance to hired farm workers. In this survey detailed socioeconomic information as well as a 52 week work history for the fiscal year 1970 was obtained for each sample worker. While the survey included interstate and local workers, this analysis is limited to the sample of 364 local workers. Of these 364 workers, 293 did farm work only and 71 did farm and nonfarm work.4/

Local labor market variables were constructed from data contained in the decennial census reports [19, 20, 21, 22, 23, 24, 25, 26]. The local labor market for a worker is defined as all contiguous counties whose largest city is within 50 miles (maximum commuting distance) of the largest city in the worker's resident county.

The Findings

Average annual cash wages and average weekly wages per week of employment for workers who do farm and nonfarm work and those who do farm work only are shown in Table 1. Average weekly cash wages are reflective of the wage rate earned by the two groups, while average annual wages are reflective of the combined effects of the wage rate and the hours of work performed during the survey year.5/ The data show that both the average

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3/ See footnote 2.

4/ For a more detailed description of the surveys see [2] and [3].

5/ The use of average weekly earnings as a measure of the wage rate assumes that the hours worked per week is the same for those workers who do farm work only and those who do farm and nonfarm work. While a preferable measure of the wage rate would be hourly earnings such a measure is not available from the survey data.

weekly and annual cash wages are higher among those workers who do farm and nonfarm work, although average annual wages are not significantly higher because these workers are unemployed or not in the labor force during more weeks than workers who do farm work only. If the comparison is limited to those workers in the two groups with 39 or more weeks of employment, the average earnings differential increases. Workers with 39 or more weeks of farm and nonfarm employment earned an average of $3,977 while those with 39 or more weeks of farm work only earned an average of $3,600. Another criterion for evaluating the benefits of farm-nonfarm mobility, differential expected lifetime earnings, is not reflected in the one year earnings data shown in Table 1. Presumably, the likelihood of moving into permanent higher paying nonfarm jobs is greater for workers who do farm and nonfarm work. For many such workers multiple jobholding probably represents the first step in a series which culminates in settlement in the nonfarm labor force.

Results of a fitted regression equation with the dichotomous work force status variable as the dependent variable are shown in Table 2. The results show that the coefficients of 4 of the 6 personal characteristic variables are significantly different from zero at least at the .05 level and have the expected sign. In contrast, none of the local labor market variables are significant. Basically, the results show that a worker is more likely to do farm and nonfarm work as opposed to farm work only if (1) he has had recent nonfarm work experience, (2) he is young, (3) he is black, and (4) he is relatively highly educated.

Table 1
Average Annual and Weekly Cash Wages for Local Hired Farm Workers in Delaware and West Virginia
Fiscal Year 1970

	Type of Hired Work		
	Farm Work Only	Farm and Nonfarm Work	F Ratio
Average Weekly Cash Wages per Week of Employment	$ 69.78	$ 77.67	3.07
Average Annual Cash Wages	$3,217.00	$3,322.00	.16

Table 2
Fitted Regression Equation for the Work Force Status of Local Hired Farm Workers in Delaware and West Virginia with Dichotomous Dependent Variable

Variable [c]	Beta Coefficient Value	Beta Coefficient Rank	Contribution to R^2	t Ratio
X_1 - Age	-.1857	2	.0517	3.76[a]
X_2 - Father's Occupation	-.0008	10	.0000	.02
X_3 - Race	-.1714	3	.0150	3.45[a]
X_4 - Education	.0977	4	.0078	1.93[b]
X_5 - Use of Employment Service	-.0669	6	.0044	1.50
X_6 - Years Nonfarm Work	.4971	1	.2575	11.08[a]
X_7 - Change in Employment	.0361	7	.0001	.40
X_8 - Differential Income	.0824	5	.0032	1.39
X_9 - Unemployment Rate	.0240	8	.0002	.30
X_{10} - Farm Employment/ Total Employment	.0180	9	.0005	.29
	R^2 = .3405	d.f. = 353		

a/ Significant at the .01 level.

b/ Significant at the .05 level.

c/ The variables are defined fully in the text.

By far the most important variable in discriminating between the two groups of workers is years of recent nonfarm work experience (X_6). In terms of the beta coefficient, this variable has almost three times the weight as the next most important variable in discriminating between the two groups of workers. This variable accounts for 76 percent of the explained variation. The next two most important variables in terms of the beta coefficients are age (X_1) and race (X_3). Together, these two variables account for 20 percent of the explained variation. The beta coefficient of education (X_4) is about one fifth as large as the coefficient of nonfarm work experience, and accounts for 2 percent of the explained variation.

To test whether mobility patterns of hired farm workers might be more sensitive to a segment of the labor market (in terms of the occupational matrix) than to overall labor market conditions, variables X_7, X_9, and X_{10} were recomputed on the basis of the census occupations (craftsman, foreman and kindred workers, operatives, laborers except farm, service workers, and farm workers and foreman). When these variables are substituted in the equation, the results remain essentially unchanged from the previous equation.

To test whether there was multicollinearity between a worker's personal characteristics and the conditions of his local labor market, the two step regression procedure proposed by Wachtel and Betsey [27] was used. The results of the analysis indicate that multicollinearity has not severely affected the beta coefficients. Regardless of the order of the regressions, the variables retain the same rank as in the single equations.

Results of a fitted regression equation with number of weeks of nonfarm work as the dependent variable are shown in Table 4. The findings indicate that 4 of the 6 personal characteristic variables are significantly different from zero at least at the .05 level and have the expected signs. Each additional year in which a worker did any nonfarm work during any of the 5 years preceding the survey year is associated with 5 weeks of additional nonfarm work during the survey year, while the effect of being black is associated with 4 additional weeks. An additional year of formal education is associated with an additional one-half week of nonfarm work, while an additional year in age is associated with a negative change of one-tenth of a week.

Use of the public employment service is statistically significant, but has a negative effect on weeks of nonfarm employment. This relationship is not consistent with the notion that the employment service facilitates the farm-nonfarm movement of workers. A possible explanation for the negative effect is that the employment service represents a last resort for those who are unable to make the transfer between farm and nonfarm work on their own.

Finally, none of the local labor market variables are statistically significant in explaining the number of weeks of nonfarm work. Of the total explained variation, 99 percent is accounted for by personal characteristic variables.

Table 3
Fitted Regression Equation for the Work Force
Status of Local Hired Farm Workers
in Delaware and West Virginia with Dichotomous Dependent Variable
using Altermative Labor Market Variables

Variable [c]	Beta Coefficient Value	Beta Coefficient Rank	Contribution to R^2	t Ratio
X_1 - Age	-.1864	2	.0517	3.77[a]
X_2 - Father's Occupation	-.0006	10	.0000	.01
X_3 - Race	-.1708	3	.0150	3.43[a]
X_4 - Education	.0964	4	.0078	1.91[b]
X_5 - Use of Employment Service	-.0661	6	.0044	1.48
X_6 - Years Nonfarm Work	.4967	1	.2575	11.07[a]
X_7 - Change in Employment	.0187	8	.0000	.22
X_8 - Differential Income	.0830	5	.0032	1.36
X_9 - Unemployment Rate	.0139	9	.0000	.20
X_{10} - Farm Employment/ Selected Non-farm Employment	.0284	7	.0007	.46
	R^2 = .3405		d.f. = 353	

a/ Significant at the .01 level.

b/ Significant at the .05 level.

c/ The variables are defined fully in the text.

Table 4
Fitted Regression Equation for the Work Force Status of Local Hired Farm Workers in Delaware and West Virginia with Continuous Dependent Variable

Variable[c/]	Beta Coefficient Value	Beta Coefficient Rank	Contribution to R^2	t Ratio
X_1 - Age	-.1029	6	.0231	2.11[b/]
X_2 - Father's Occupation	.0143	10	.0002	.32
X_3 - Race	-.1226	2	.0087	2.49[b/]
X_4 - Education	.1039	4	.0071	2.07[b/]
X_5 - Use of Employment Service	-.1038	5	.0090	2.35[b/]
X_6 - Years Nonfarm Work	.5576	1	.3019	12.57[a/]
X_7 - Change in Employment	.1110	3	.0018	1.25
X_8 - Differential Income	.0572	7	.0022	.97
X_9 - Unemployment Rate	.0394	8	.0004	.50
X_{10} - Farm Employment/ Total Employment	-.0166	9	.0001	.27
	R^2 = .3544		d.f. = 353	

a/ Significant at the .01 level.

b/ Significant at the .05 level.

c/ The variables are defined fully in the text.

Summary and Conclusions

While admittedly derived from a narrow data base, the results of this study indicate that the work force status of local hired farm workers depends primarily upon the characteristics of the workers themselves and very little on the conditions of their respective local labor markets. This implies that a labor market solution to the low income problem of hired farm workers via multiple jobholding and farm-nonfarm mobility must concentrate primarily on enhancing worker employability. However, this is not to say that programs to enhance the nonfarm employability of the workers who do farm work only is the most cost-effective means for reducing the incidence of poverty among that group. Such an approach must be considered alongside transfer payments and increased productivity and earnings in farm employment. Probably none of these three approaches is consistently the most cost-effective approach for the universe of hired farm workers. While this study does not specify the most cost-effective solution to the problem, it does isolate some of the variables that are important in policy formulation with respect to the problem.

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