7-1981

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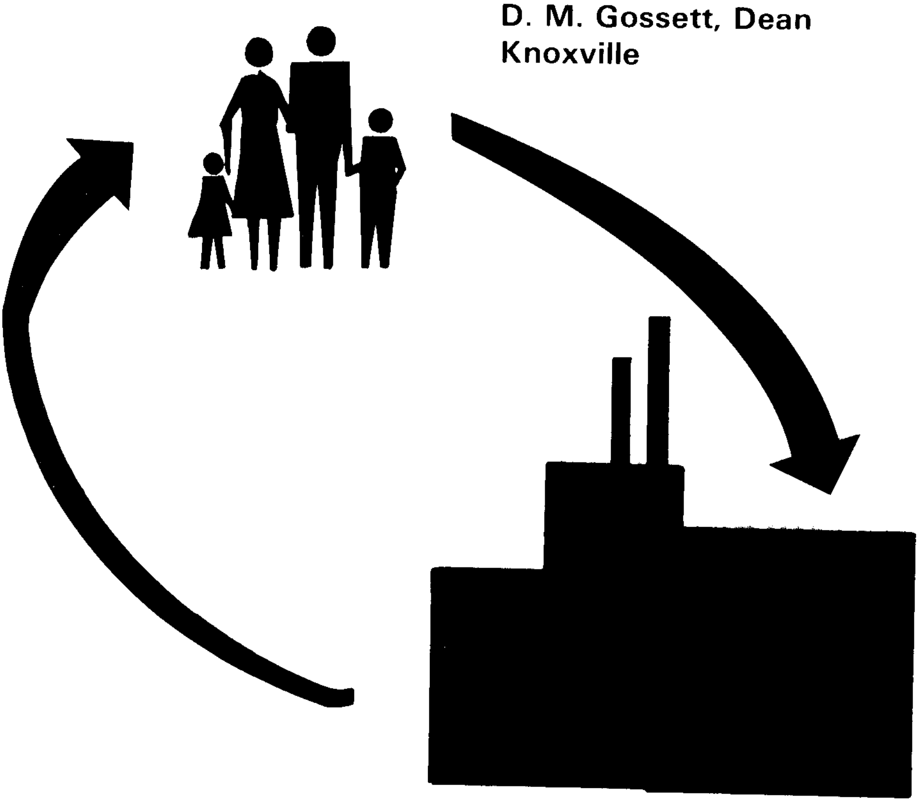
Bulletin 603
July 1981

The University of Tennessee
Agricultural Experiment Station
D. M. Gossett, Dean
Knoxville



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Thomas H. Klindt, Maurice R. Landes and Brady J. Deaton*

INTRODUCTION

During the past 20 years, industrialization has been a prominent aspect of economic development in rural areas of Tennessee. During this period, rural manufacturing plant locations and employment have been increasing both in absolute terms and relative to urban areas of the state. Manufacturing income, as a component of total personal income, has also been increasing in rural areas through most of this period (Landes [6]), even though at the national level there has been a relative decline over the past decade.

This trend toward increasing industrial activity in rural areas carries many potential economic benefits for rural people and communities. Basic employment opportunities created by new plants can provide wages and salaries and form an economic basis for the continued growth of employment, personal income, and public revenues. The creation of such employment opportunities may also facilitate the development of human capital and help to prevent the loss of that human capital through migration.

The incidence of industrial locations and the economic impacts of industry are not uniform among rural communities. While some communities are successful in attracting, maintaining, and expanding industry, others are not (Smith, Deaton, and Kelch [12]). Also different communities and industries seem to exhibit varying income and employment leakages to nonlocal people because of varying rates of commuting. Communities also differ in the amount of income and job benefits which go to the disadvantaged.

The objective of the bulk of industrial impact research has been to develop aggregate measures of the effect of new and expanding industry on community income and employment using multiplier statistics. Garrison [2,3], Shaffer [10], and Rheinschmiedt [9] dis-

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This research was funded in part by the Tennessee Valley Authority and by Title V of the Rural Development Act of 1972.

aggregated income and employment multipliers in order to assess the allocation of net economic impacts between public and private sectors. These measures have provided valuable information to community leaders concerning the generation of income and jobs within the community.

Justification for in-depth analysis of the distribution of income and employment among individuals is found by exploring the theories of industrial location and welfare maximization. The distribution of earned (as opposed to transfer) income is affected by modifying the distribution of factor earnings through redistribution of the ownership of factors of production, changing factor prices, or changing factor employment. Bator [1] showed that under purely competitive conditions the price system will allocate factors of production and distribute products in an efficient manner. The allocation of utility among individuals results from the original configuration of factor allocation and will only coincidentally equal the optimal distribution of utility based on a given social welfare function.

The theories of industrial location developed by Weber [21], Isard [5], and Losch [20] similarly hold that industries tend to locate and achieve efficiency according to the prices of their relevant resource and transportation inputs. It has been conventionally hypothsized that the location of new plants in rural areas of Tennessee has been due to the availability of relatively cheap labor, perceived qualitative advantages of rural labor, inproved interstate highway transportation, and the growth of southern markets.

To the extent that the location of industry in rural areas is a response to economic factors in a purely competitive market, there is no reason to expect that the resulting reallocation of resources (income and jobs) provides utility which is consistent with egalitarian policy objectives. National, state, and local subsidization policies designed to attract industry to rural areas alter purely competitive conditions in the interest of reallocating resources and derived benefits (jobs and income). Therefore, examination of the distributive aspects of industrial locations, subsidized or not, is of value in assessing the extent to which industrial impacts are agreeing or conflicting with regional and national equity objectives.

The importance of including distributional goals in the formulation of development objectives has been suggested by a number of writers. Gotsch [4] has argued that the improved distribution of jobs and income will serve to bring more people into the mainstream of development. The importance of this notion is supported by Tweeten's argument that people who are left out of the mainstream of economic life develop attitudes that make their entry into the productive labor market even more difficult [17]. The importance of the expansion of job opportunities is also supported by Schultz [11] in his discussion of investment in human capital. He argued that unemployment leads to deterioration of human capital due to impairment of acquired skills and that transfer payments do not prevent idleness from taking its toll on the unemployed.

The above arguments support the idea that the roots of income distribution lie in the distribution of jobs. If new industry can succeed in improving the distribution of jobs and income, it can facilitate a reduction in transfer payments and future development costs as well as enable local communities to recover their investment in human capital.

OBJECTIVES

The primary objective of this study was to evaluate the distributive impact of industrialization on the family income of workers employed in new industrial plants located in rural Tennessee. More specific objectives were to:

1. Estimate the impact of selected plant, community, and individual characteristics on employee family income changes.
2. Describe the primary round impact of new industrial plants in Tennessee with emphasis on changes in the incidence of poverty.

PROCEDURE

The general form of the research model used to address objective 1 was:

$$\Delta Y = f(\Delta CY, D, T, PC, CC, A) \quad (1)$$

where:

ΔY = real change in employee's family income
ΔCY = changes in sources of income
D = demographic characteristics of individual employees and their families
T = length of time employed in the manufacturing plant
PC = plant characteristics
CC = community characteristics
A = variables which indicate the relative well-being of employees' families prior to manufacturing employment

Two time periods were important in the model: the time just prior to job entry into a plant (t_1) and 1977, the year in which survey data were collected for the study. The time t_1, was specified in general terms rather than a particular date, because the date of employment varied in the sample. A family member entering the work force of a new plant may have experienced an abrupt initial shift in income at the time of employment, particularly if he/she was unemployed or significantly underemployed in t_1. Initial changes in income were measured as income during the first year of employment at a plant minus income in the year of t_1. Subsequent changes in wage income were due to differences in wage earnings in the firm between the time of the initial change and 1977. The dependent variable (ΔY) was the change in real family income from all sources from t_1 to 1977. Independent variables (specified in a subsequent section) were introduced to measure the influence of different factors hypothesized to influence income changes between t_1 and 1977. Ordinary least squares (OLS) procedures were used in the analysis.

The second objective was addressed by establishing quintile ranges of the family income distribution for the aggregate of the 24 counties in the study area (see data section). The distribution of new plant employee family incomes among the quintiles in t_1 and 1977 was then assessed. In addition, family characteristics were used to establish a poverty threshold for each sample family and movements across the thresholds between t_1 and 1977 were evaluated.

DATA

To fulfill the objectives of this study, primary data to measure changes in family incomes and employee wage incomes due to employment in new manufacturing plants were obtained by surveys completed during the summer of 1977. Primary data were also collected to obtain information about the characteristics of the new plants employing the workers sampled. Data on relevant characteristics of communities in the study area were available from secondary sources.

The sample was drawn by a random selection of manufacturing plants located in rural areas of the state. This random selection of plants yielded a weighted random sample of communities because each community's probability of selection was weighted by the number of plants located in it. Plant data were collected through personal interviews with plant management personnel. Employee data were then collected by questionnaire at the employee's place of work by sampling the work forces of the plants whose management agreed to participate in the study.

Sample plants were selected from the population of manufacturing firms with 20 or more employees that located in rural Tennessee counties during the 4-year period, January 1, 1970 to December 31, 1973. The definition of manufacturing plants adopted for the study was the one used by the **Census of Manufacturers** [19] and included all plants with two-digit Standard Industrial Classification (SIC) codes 20 through 39. The definition of rural area used was any county in the state that was not part of a Standard Metropolitan Statistical Area (SMSA) as of 1973. The study population included 160 manufacturing plants. These plants were located in 60 of the 76

Tennessee counties defined as rural for the purposes of this study. Of the 160 manufacturing plants, data were obtained from 35 randomly selected plants.[1] These plants were located in 24 of the 60 Tennessee counties defined as being rural and having plant locations (see Figure 1).

A random 20% sample of each plant's work force was believed to be manageable in terms of data collection and yet provide an adequately representative sample of each firm's employment. At the same time, this approach was expected to yield a sufficient number of observations for the planned analysis.[2]

The employee survey yielded 712 completed questionnaires. For the purpose of analysis, some of the observations were deleted from the employee sample due to incomplete or inconsistent data. The major group deleted consisted of persons reporting zero total family income in period t_1, usually because of nonparticipation in the labor force and/or residence with parents during that period. This group was deleted from the analysis because it was assumed that such responses constituted inaccurate estimates of real income. Similarly, all persons reporting residence with parents in period t_1, and not in 1977 and not reporting income contributed by parents, were deleted because of inconsistent reporting of income. Those persons living with parents in both t_1 and 1977 were kept in the sample. It was assumed that while this situation may have resulted in inaccurate absolute income estimates in each period, it would not have seriously distorted the amount of income change between t_1 and 1977 since the perceived income would have been consistently estimated in each period.

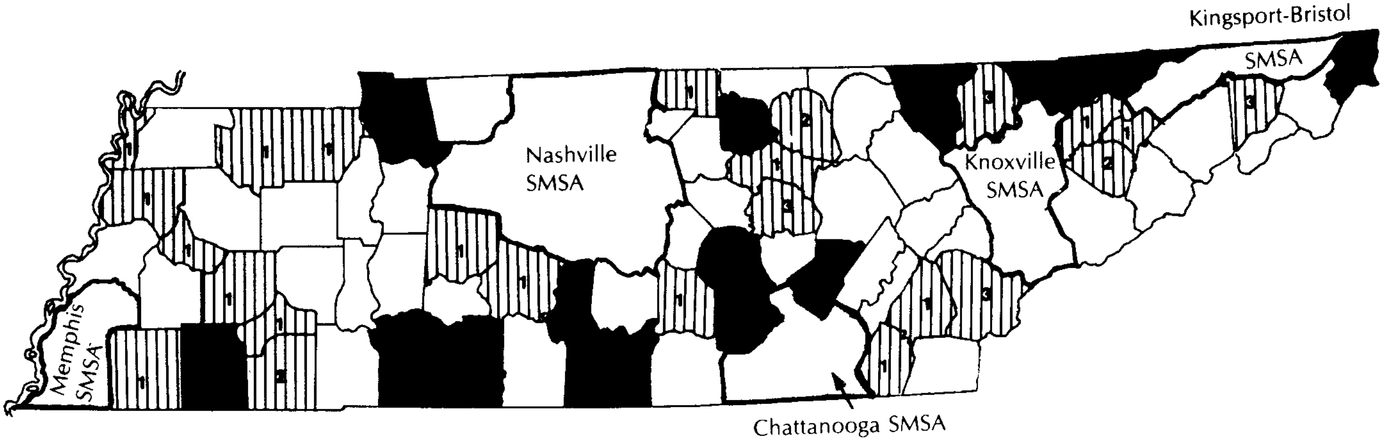
Total deletions amounted to 147 observations which left 565 usable observations. The resulting average sample proportion per plant was 18%.

FACTORS INFLUENCING FAMILY INCOME CHANGES

In this section the analysis of factors influencing changes in family incomes due to employment in new rural manufacturing firms is presented. First, the variables and hypothesized relationships necessary to operationalize the theoretical model are specified. The model is then used to analyze changes in family incomes using OLS regression analysis and the results of the analysis are reported.

[1] Difficulty was experienced in efforts to compare sample plants to either the study population or rural Tennessee plants in general because of the lack of comparable data. However, it did appear that the sample was weighted toward smaller plants. For more information on comparisons, see Landes [6].

[2] Data collection problems precluded the inclusion of salaried supervisory and management level personnel. It was recognized that this exclusion biased the sample away from high income employees.



-denotes county included in sample

—denotes county included in study population but not in sample

—denotes rural counties not included in the study population because they received no new locations of manufacturing plants of greater than 20 employment between January, 1970, and December, 1978

Note: SMSA areas are defined using the 1973 definition.

Note: Numbers denote the number of respondent plants in each sample county.

Figure 1. Map of Rural Tennessee Counties Included in the Study Population and in the Sample Including the Number of Sample Plants in Each Sample County.

Model Specification and Expected Relationships

The general model included seven groups of variables (see equation 1). Each variable is specified and expected effects of each independent variable on income change is presented below.

Dependent Variable

The dependent variable used for this analysis was the change in annual total family real income between the year ending with the time of the survey (1977)[3] and the year immediately preceding employment in the sample plant (t_1). Real income changes were used to eliminate inflationary increases in income so that actual changes in family purchasing power could be better examined. All dollar figures were adjusted to 1977 levels using the appropriate U. S. Department of Labor unadjusted Consumer Price Index for all items. Total family income included wage and salary incomes, second job incomes, transfer payments, and all other types of income, including proprietary incomes, farm earnings, and pensions, of the employee and all other family members living at home. The dependent variable was given the acronym TAFYCH and specified in thousands of dollars.

Changes in the Sources of Family Income

Family member employment in a new plant may have been accompanied by changes in family income structure between periods t_1 and 1977 including changes in spouse labor force status, changes in transfer payments received, and changes in other sources of family income. Changes in family income structure may have occurred either as a result of family member employment in a new plant or due to other independent factors.

The effects of changes in the components of family income were measured in the operationalized model by specifying a series of discrete (0,1) variables. The family member employed in the sample plant could have been either in or out of the labor force in period t_1. Previous employment was expected to reduce the amount of initial income change (the period of entry into the firm) but improve a worker's potential for upward mobility in the firm (subsequent change) because of skills obtained in previous employment. Because the initial wage change was expected to be greater than the change associated with upward mobility, the net effect of previous employment (PREMP) on t_1 to 1977 family income changes was hypothesized to be negative relative to a person with no previous employment. To measure this effect, the variable PREMP was entered and set at zero if the employee was unemployed for the entire year pre-

[3]The survey was conducted in June, July, August, and September, 1977. Therefore, the length of employment in a sample plant could vary from 1 day to 7 years and 9 months (January, 1970 to September, 1977).

ceding entry into the work force of the sample plant. PREMP was set at one (1) if the employee worked at all during the year. A wage income above zero in t_1 was used as an indicator of previous employment, while a wage income of zero indicated no previous employment. The coefficient was expected to be negative.

Changes in spouse labor force status between periods t_1 and 1977 were characterized by one of four possibilities: the spouse entering the labor force, the spouse exiting the labor force, the spouse staying in the labor force, or the spouse staying out of the labor force. To measure the effects of these changes, discrete (0, 1) variables were entered to represent a spouse entering (SPENT), exiting (SPEX), or staying in (STAYIN) the labor force. The situation depicted by the spouse stayed out of the lobor force in both periods (STAYOUT) was the omitted class against which the others were tested. Positive values for spouse wage incomes in t_1 and 1977 were used as indicators of labor force participation, while spouse wage incomes of zero in t_1 and 1977 indicated labor force nonparticipation.

Spouse entry into the labor force (SPENT) was hypothesized to have a positive influence on income change compared to the STAYOUT situation because the family gained a source of income. Similarly, spouse exit (SPEX) was expected to reduce income changes compared to the omitted class because of the loss of a source of income. STAYIN was expected to have a positive relationship with family income change because spouses remaining in the labor force were expected to earn increased wages between t_1 and 1977 due to productivity gains, negotiated wage gains, etc.

Families may have gained, lost, maintained, or never have had transfer payments and/or other sources of family income between t_1 and 1977. Positive values for transfer and other income in either t_1 or 1977 were used as indicators of the existence of either source of income, while zero values indicate their absence. For the purpose of this analysis, discrete variables were entered only to measure the effects of a gain (GTP) or loss (LTP) of transfer payments and a gain (GOTH) or loss (LOTH) of other sources of family income. The omitted classes against which these changes were measured were those observations which either maintained or never had transfer payments or some other source of income between periods t_1 and 1977. The two omitted classes were not differentiated because there was no **a priori** reason to expect that either would significantly affect family income changes. The gain of transfer payments (GTP) and/or the gain of other income (GOTH) were expected to have a positive relationship with family income changes compared to the omitted classes, while the loss of transfer payments (LTA) and/or other income (LOTH) were expected to have a negative relationship.

Demographic Characteristics

Age, sex, and the level of educational attainment of the employee and the change in the number of children in the employee's family were entered into the equation to measure the demographic characteristics of employees and their families. Age (AGE) was specified in years, and an inverse relationship with family income change was expected. Younger workers and families were hypothesized to be more competitive and less likely to have reached their income potential resulting in greater initial and subsequent income gains than older workers and families.

Sex (SEX) was specified in the equation as a discrete variable with male employees denoted by a zero (0) and females by a one (1). Female employees were expected to have a greater influence than males on initial family income gains. This is because female workers were expected to be more frequently supplemental, rather than primary, family wage earners. Alternatively, female employees were expected to have less impact than males on subsequent family income due to less upward wage mobility. This weak hypothesis was based on the expectation that females would more likely be employed in low-skill, low-wage, labor-intensive plants in which there is less potential for upward wage mobility. It was hypothesized that the expected relatively large initial shift for females would offset the expected smaller subsequent change resulting in a positive coefficient for the sex variable.

Education (EDUC) was specified in the equation as the total number of completed years of primary and secondary school, college, vocational school, and any other type of formal education. It was hypothesized that more educated workers would have relatively greater initial and subsequent wage income shifts leading to relatively greater family income gains.

Change in the number of children in an employee's family (FAMCH) was specified as the number of children in 1977 minus the number of children at the end of period t_1. Greater increases in family size were expected to lead to greater increases in family income because of greater incentives to seek higher paying jobs. This hypothesis was suggested by the earlier studies of Morgan [7].

Time Variable

The employees included in the sample could have been employed in the sample plants for varying lengths of time from 1 day to 93 months (January, 1970 through September, 1977). The scope for change in the various components of family income, including employee wage gains due to within-firm mobility and changes in the wages of other family members, was expected to be influenced by the period of time over which income changes were measured (t_1-

1977). That is, workers with longer tenure would probably have experienced a greater absolute wage increase even though the rate of wage gains might be quite low. Therefore, to control for variation in the time factor, the number of months each employee worked in the sample plant (MOWKPL) was entered into the equation and a positive coefficient was expected.

Plant Characteristics

Variables were specified in the equation to measure the effects of plant size, wage levels, and skill levels on family income changes. Plant size (in terms of employment) was expected to indicate the magnitude of shift in labor demand in the community caused by the location of a new plant. The amount of pressure a given plant places on local labor resources depends on the amount of labor demand created by the plant relative to the community labor supply. The greater the labor needs of the plant relative to supply, the greater was the expected increase in employee wage incomes (hence family incomes) in both the initial and subsequent periods because of greater upward pressure on wage rates and because more previously unemployed and underemployed persons are likely to be employed. Also, plants of greater relative size were hypothesized to provide greater opportunity for upward mobility of workers in the t_1 to 1977 period. To test this hypothesis, plant size as a percentage of the total community labor force (SIZRLF) was entered into the equation. SIZRLF was specified as total plant employment in 1977 divided by the total county labor force in 1977 (from [16]) multiplied by 100.

Plant wage levels relative to prevailing labor market wage levels (RLWAGE) were hypothesized to be indicative of the potential for employee income changes between t_1 and 1977. Plants offering higher relative wages and, thereby, probably requiring greater labor skills could have contributed to relatively smaller initial wage shifts if hirees tended to be previously employed at skilled jobs. But because previous employment was already controlled for in the equation and because of the high levels of underemployment commonly experienced in rural labor markets, it was expected that workers employed in plants with higher relative wage levels would experience greater initial wage income changes.[4] Workers employed in plants with higher relative wage levels were also expected to have greater subsequent wage increases because of greater scope for such changes. Plant wage levels relative to the community average wage (RLWAGE)

[4]Underemployment was also included as a variable in the equation. But all counties in the sample were rural and all probably had "loose" labor markets with relatively high rates of underemployment compared to more developed urban labor markets. Therefore, the hypothesized relationship was expected to hold in most, if not all, of the sample counties regardless of the underemployment rate.

were specified in the equation as the average weekly wage of the worker sample in each plant as a percentage of the average weekly manufacturing wage in the county in which the plant was located in 1977 (from [15]). A positive coefficient was expected for RLWAGE.

Plant skill levels were expected to influence income changes in a way similar to plant wage levels. In tight labor markets with low rates of underemployment, firms employing highly skilled workers were expected to hire experienced and probably previously employed workers leading to relatively smaller initial income changes. But in labor markets characterized by relatively high rates of unemployment and under employment, plants with higher skilled workers were expected to provide greater scope for workers to escape underemployment leading to greater initial income gains. Subsequent income gains were also expected to be greater in higher skilled plants due to improved possibilities for upward mobility and management desire to keep trained workers.

In tight labor markets, wage and skill levels can be expected to be highly correlated. It was anticipated, however, that the relative wage measure and the skill index would not necessarily be correlated in the relatively loose and underdeveloped labor markets in a number of the counties involved in this study. Therefore, measures of both wage and skill levels were included in the equation. Plant skill requirements were measured by asking plant managers to categorize all production workers in their plant as being skilled, semi-skilled, or unskilled according to the years of training required to perform job tasks. Workers requiring 3 or more years of training were considered skilled, those requiring 1 or 2 years of training were considered semi-skilled, and those requiring less than a year of training were considered unskilled. From this categorization a weighted skill index (SKILL) was computed for each plant by weighing the percentage of skilled workers by positive two (+2), the percentage of semi-skilled workers by one (+1), and the percentage of unskilled workers by zero (0), and summing the results. This measure could theoretically range from zero (0) (100% unskilled) to two (2) (100% skilled). A positive relationship with the dependent variable was hypothesized since skill levels were expected to be associated with positive wage changes.

Community Characteristics

The composition of community labor supply was determined, in part, by the rates of underemployment, unemployment, and potential labor force entry. Underemployment exists when an employed worker has capacity in excess of that being used in his current job. Unemployment exists when workers are unemployed and are actively seeking employment. Potential labor force entrants are those who are unemployed and not actively seeking employment but who would under different economic conditions.

Higher rates of underemployment suggest greater percentages of the labor force producing at less than capacity in current employment and, therefore, greater availability of workers capable of moving into higher wage and skill jobs. This excess supply was expected to result in suppressed wage rates in the labor market leading to smaller income gains.

Higher rates of unemployment and potential labor force entry suggest greater availability of persons who are currently idle but available to take new jobs. Higher rates of unemployment and potential labor force entry were, therefore, also expected to result in suppressed wage rates and lower wage and income gains. Because both the rate of unemployment and the rate of potential labor force entry reflect the supply of available but idle labor in the community, the two rates were combined for the purpose of this analysis. The resulting measure was felt to be a more accurate measure of the availability of unemployed labor than either measure alone.

The combined rate of unemployment and potential labor force entry (UNPTR) was specified using 1970 data. Data on labor force size and numbers of unemployed persons in each sample county were from the 1970 census. Potential labor force entry in each county was calculated using the method developed by Stoll [14]. The rates of underemployment (UNDERR) specified in the equation were computed by Snell and Leuck [13] for each Tennessee county, also using 1970 data. Because UNDERR conceptually embodied both unemployment and underemployment in the county, the 1970 county unemployment rate (from [18]) was subtracted from each figure.

Using UNPTR and UNDERR rates from 1970 data created a measurement problem because a 1977 rate would have more accurately described labor market conditions at the time of the survey. However, the data required to calculate rates for 1977 were not available. Specifications using 1970 data required the assumption that unemployment, underemployment, potential labor force entry rates in each of the sample counties did not change relative to each other beween 1970 and 1977. Negative coefficients were expected for both UNPTR and UNDERR.

Residence Status Variables

Measurement of the relative income changes for local as compared to commuting, migrating, and return migrating labor was expected to indicate the extent to which nonlocal workers competed with local workers for income gains from new employment opportunities. Migrating and commuting laborers may have had greater income gains than local workers if they provided skills not available among local workers. Return migrating workers may have been more likely to incur income losses in order to return to their home county as previous research by Morgan and Deaton [8] would indicate.

Employee residence status was entered into the equation using a series of discrete variables. Workers were designated as commuters (COMM) if they did not reside in the county in which the sample plant was located at the time of the survey. Workers were designated as migrants (MIG) if they lived in the county in which the sample plant was located at the time of the survey, if they had never previously lived in that county, and if they had moved to that county after the age of 16. The latter restriction is placed on the definition of migrant because persons moving prior to the age of 16 were not likely to be in the labor force and seeking employment. Return migrants (RMIG) were defined as workers who lived in the county in which the sample plant was located at the time of the survey, had previously lived in that county, and had returned to that county after the age of 16. Any employees in the sample not qualifying for any of the above categories were considered local.

Local workers were the omitted class in the series of discrete variables measuring employee residence status against which the income gains of the three "nonlocal" groups were tested. It was hypothesized that commuters (COMM) and migrants (MIG) would have greater income gains and return migrants (RMIG) smaller income gains than local workers.

Well-Being Status Variables

The purpose of this group of variables was to measure the changes in family income accruing to families with different levels of relative well-being prior to family member employment in the sample plants. Each family's well-being status in t_1 was calculated by subtracting the poverty level income for the appropriate family size from real family income in t_1.[5] Family well-being was thus defined as a family's residual income above (or below) the official poverty level for that family. These changes in income were analyzed by adjusting total family incomes in t_1 for family size in order to reflect more adequately the well-being of the family by ranking the adjusted incomes, by classifying the sample into quintiles, and by entering each family's quintile of well-being into the regression equation using a series of discrete (0,1) variables (Q_1, Q_2, Q_4, and Q_5, where Q_1 was the lowest quintile and Q_5 was the highest). A one (1) indicates a family's presence in a particular quintile in t_1, and a zero (0) indicates its absence. The third quintile was the omitted class against which the family in-

[5]The poverty levels used for families of different size were those of the Bureau of the Census in 1970 adjusted to 1977 price levels using the U. S. Department of Labor unadjusted Consumer Price Index for all items.

come changes of the remaining four quintiles were tested. A positive coefficient indicates that families in that quintile had greater income gains than families in the third quintile, and a negative coefficient indicates that families in that quintile had smaller income gains. There were no hypothesized relationships since these variables were entered only for the purpose of analyzing changes in the distribution of income gains within the sample.

Results of the Regression Analysis

The results of the multiple regression analysis are presented in Table 1. The variables in the regression model are grouped to illustrate the contribution of each variable group (ΔCY, D, T, PC, CC, A) to the total R^2 of .602. Selected statistics for all independent variables in the equation are presented in Table 2.

Changes in the Sources of Family Income

PREMP. The coefficient for the variable PREMP was significant and had the hypothesized sign. The coefficient indicates that, with other variables in the equation held constant, workers in the sample who had wage earnings in the year prior to employment in the sample firm had smaller family income changes than workers with no previous wage earnings by the amount of $2,198. Of the sample workers, 83.4% were employed in the year prior to entering the sample plants. It should be noted that the seemingly low percentage (16.6%) of previously unemployed workers was, in part, due to the deletions from the sample noted previously. Many of the deleted observations were previously unemployed workers who failed to report any source of income in period t_1.

SPENT, SPEX, and STAYIN. Each of these variables was significant and had the hypothesized sign. Compared to the omitted class of workers who had no spouse in the labor force in either t_1 or 1977, workers who had spouses enter the labor force had a positive $4,986 family income change, while the comparable figures for workers who has spouses exit or stay in the labor force were negative $3,811 and positive $2,955, respectively. Examination of the means of the labor force participation variables in Table 2 indicates that 10.4% of the workers sampled had spouses enter, 11.3% had spouses exit, and 42.8% had spouses remain in the labor force between t_1 and 1977. The omitted class of workers who had no spouse in the labor force in either period constituted 35.5% of the sample.

Table 1. Results of Regression Analysis to Explain Changes in Family Income Associated with New Manufacturing Jobs in Rural Tennessee Counties

Variable	Specification	b Value	Standard error
INTERCEPT	–	-0.420	1.491
PREMP	0,1	-2.198***	.438
SPENT	0,1	+4.896***	.466
SPEX	0,1	-3.811***	.522
STAYIN	0,1	+2.955***	.414
GTP	0,1	+1.724**	.718
LTP	0,1	-0.623*	.364
GOTH	0,1	+1.556***	.395
LOTH	0,1	-5.312***	1.292
AGE	years	-0.003	.016
SEX	0,1	+0.166	.332
EDUC	years	+0.226***	.063
FAMCH	number	+0.096	.227
MOWKPL	months	+0.011*	.006
SIZRLF	%	+0.287***	.072
RLWAGE	%	+0.041***	.007
SKILL	index	−1.476***	.668
UNDERR	%	-0.127***	.024
UNPTR	%	-0.019	.013
COMM	0,1	+0.203	.374
MIG	0,1	+0.328	.395
RMIG	0,1	−1.141***	.373
Q_1	0,1	+2.158***	.453
Q_2	0,1	+1.036**	.438
Q_4	0,1	-1.846***	.438
Q_5	0,1	-4.720***	.452

R^2 = .602 F = 31.10 n = 539 Mean of dependent variables (TAFYCH) = 2.894

*Significant at the .10 level of t.
**Significant at the .05 level of t.
***Significant at the .01 level of t.

Table 2. **Selected Statistics for Variables Included in the Regression Analysis of Changes in Family Incomes**

Variable	Specification	Mean	Standard deviation	Minimum	Maximum
TAFYCH	$ 1977 (000's)	2.894	3.012	-19.978	17.524
PREMP	0,1	.834	.373	0	1
SPENT	0,1	.104	.306	0	1
SPEX	0,1	.113	.317	0	1
STAYIN	0,1	.428	.495	0	1
GTP	0,1	.039	.194	0	1
LTP	0,1	.166	.373	0	1
GOTH	0,1	.140	.347	0	1
LOTH	0,1	.012	.111	0	1
AGE	years	32.467	10.273	17	64
SEX	0,1	.517	.500	0	1
EDUC	years	10.973	2.405	1	18
FAMCH	number	.218	.648	-2	5
MOWKPL	months	34.727	25.785	1	93
SIZRLF	%	2.628	2.346	.083	6.462
RLWAGE	%	105.469	25.879	46.286	172.989
SKILL	index	.205	.243	0	1.281
UNDERR	%	23.279	6.599	8.549	33.022
UNPTR	%	11.642	11.399	-5.631	45.491
COMM	0,1	.177	.382	0	1
MIG	0,1	.152	.360	0	1
RMIG	0,1	.166	.373	0	1
Q_1	0,1	.211	.408	0	1
Q_2	0,1	.200	.400	0	1
Q_4	0,1	.196	.398	0	1
Q_5	0,1	.200	.400	0	1

GTP, LTP, GOTH, and LOTH. The public assistance (GTP, LTP) and other income (GOTH, LOTH) variables were significant with the hypothesized signs. Examination of the means for these variables in Table 2 shows that 16.6% of the families lost and 3.9% gained public assistance as a source of family income between t_1 and 1977. Also, 1.2% of the sample lost while 14% gained some other source of family income. Tables 3 and 4 present the types, frequencies, and average annual amounts of public assistance and other incomes, respectively, encountered in the sample. The most prevalent sources of public assistance incomes in both periods were unemployment compensation and social security payments. The most prevalent source of other income in both periods is part-time farming.

Table 3. Types, Frequencies, and Average Annual Amounts of Public Assistance Income Observed in the Sample Families in t_1 and 1977

	t_1		1977	
Type	Frequency	Average annual amount ($ 1977)	Frequency	Average annual amount ($ 1977)
Unemployment compensation	89	1,302	10	3,234
Aid to families with dependent Children	3	1,629	1	588
Aid to the disabled	2	3,250	2	3,960
Veterans disability	0	–	2	756
Social security	10	3,403	18	3,603
Workmen's compensation	1	2,168	1	4,420
WIC[a]	0	–	3	284

[a]Special supplemental food program for women, infants, and children.

Table 4. Types, Frequencies, and Average Annual Amounts of Other Income Observed in the Sample Families in t_1 and 1977

	t_1		1977	
Type	Frequency	Average annual amount ($ 1977)	Frequency	Average annual amount ($ 1977)
Farming (part-time)[a]	38	740	46	2,082
Self-employment (nonfarm)	10	2,796	4	3,245
Rent (structure)	2	448	6	950
Land lease/rental	0	–	3	483
Proprietorship	0	–	1	1,500
Child support	6	1,548	13	1,712
Pension (private)	1	6,336	2	6,020
National Guard	5	1,980	4	1,819
Veterans benefits (educational)	4	3,640	4	4,377
Veterans pension	0	–	2	6,050
Job training grant	2	2,592	0	–

[a]For part-time farming the dollar figure is the average annual return to land, labor, and capital. This figure is determined from data collected in a supplementary questionnaire which asked for detailed information on part-time farming operations. The supplementary questionnaire was attached to the employee questionnaire at the time of the survey to obtain data for another study. Analysis of that supplemental data is not included in this study.

Demographic Variables

Variables in this group measured the influence of worker age (AGE), sex (SEX), and education (EDUC) and change in the number of children in the family (FAMCH) on family income changes. While the coefficients for each variable in the group had the hypothesized sign, only EDUC was significant.

AGE. Worker age was expected to have a significant negative effect on income changes because it was hypothesized that older workers and families were less competitive and more likely to have reached their income potential. However, the model results indicate that the variable was not significant. An examination of the means of family income change for different age groups of workers suggested that there was, in fact, variation in the dependent variable associated with different age groups. However, the variation did not appear to be of the linear form specified. The 30-39 year old group had the highest average income change ($3,279) while the 20 years and younger and the 50 years and over groups had the smallest changes ($2,438 and $1,925, respectively). Nonlinear functional relationships were fitted with no improvements in model results.

SEX. Female workers were hypothesized to be supplemental family income earners more frequently than males and, hence, contribute relatively more than males to family income gains. The estimated coefficient indicated that, with all other variables held constant, family income change associated with female workers was $166 more than with male workers, but the estimated coefficient was statistically insignificant.

The mean family income change associated with female workers ($2,964) was virtually the same as the change associated with male workers ($2,948). However, this slight difference and the insignificant estimated coefficients do not imply that the causal forces which yielded similar family income changes were the same for male and female employees. Female employees were more often new entrants to the work force. In addition, they were more often associated with family labor force participation patterns in which family income change was greatest. However, females tended to be older, less well educated, and employed for shorter periods of time than male employees. Also, female workers tended to be employed in larger plants, which required lesser skill levels and had lower relative wage levels (see Landes [6]).

The factors which differentiated male and female workers in terms of their potential to change family incomes were apparently measured elsewhere in the equation. It appears that while female more than male employees were associated with family labor force participation patterns conducive to higher family income changes, lower wage changes for female workers offset these effects.

EDUC. The level of educational attainment of the employee was a significant variable in the equation with the hypothesized positive relationship with family income change. The coefficient was interpreted as meaning an additional year of formal education was associated with $226 in family income gains among workers employed in the sample plants than with other variables in the model held constant.

FAMCH. It was hypothesized that a change in the number of children in a family (FAMCH) would have a direct relationship with family income change because additional children would lead family members to cover higher family costs by seeking higher paying jobs. The estimated coefficient was 0.096 (an additional $96 per additional child) but was not statistically significant.

Time Variable (MOWKPL)

The variable measuring the number of months a worker was employed in the sample plant (MOWKPL) was included in the model to control for the length of time over which income and other family changes occurred. MOWKPL was significant in the results and had the hypothesized positive effect on the dependent variable. The coefficient is interpreted as indicating that, with all other factors in the equation held constant, each additional month of employment was associated with an $11 gain in real family income between t_1 and 1977.

Plant Variables

The three variables entered into the equation to measure characteristics of the sample plants were SIZRLF, RLWAGE, and SKILL. Each variable was significant with SIZRLF and RLWAGE having the hypothesized direct relationship with TAFYCH, while SKILL had an unexpected negative coefficient.

SIZRLF. Plant labor force size relative to the size of the community labor force was intended to measure the amount of pressure the new plants exerted on local labor resources and was hypothesized to have a direct influence on changes in employee wage earnings and family incomes. The interpretation of the coefficient for the variable SIZRLF is that—with all other variables in the equation held constant—a 1% increase in the size of a plant's labor force relative to the county labor force was associated with a $287 difference in the change in total family income due to a family member employment in that plant.

RLWAGE. Plants with higher average wage levels relative to the prevailing manufacturing wage rate in the community were expected to lead to greater initial and subsequent wage gains and, hence, family income gains for their employees. The empirical result was as expected with the coefficient indicating that, holding all other variables in the equation constant, a 1% difference in a plant's weekly manufacturing wage was associated with a direct $41 difference in the change in an employee's total family income.

SKILL. The skill variable, although having a significant coefficient, was the only variable in the equation not to carry the hypothesized sign. It was expected that higher skill plants provided greater potential for employee wage gains and, hence, family income gains. However, the estimated coefficient implies that, with other variables held constant, a one unit increase in the skill index was associated with a minus $1,476 change in family income. This interpretation must be qualified by the fact that only a limited range of skill indices was observed in the sample of plants used in this study. The range was from 0.00 to 1.28 and the mean was 0.22.

In an attempt to isolate reasons for the negative SKILL coefficient, a separate analysis was conducted using employee wage change rather than family income change as the dependent variable while maintaining comparable independent variables [6]. In that analysis, the coefficients for SKILL were significantly negative for both the initial and subsequent periods. However, the wage levels were higher in both t_1 and 1977 in plants with higher skill levels. A possible explanation for these unexpected results is that in the labor market studied, employees entering plants which required higher skill levels were relatively less underemployed than counterparts entering plants with lower skill levels. This appeared to be the case particularly with male employees. In the subsequent period, employees in the plants with lower skill levels received relatively more overtime compensation. Therefore, wages and wage gains were based on relatively greater amounts of labor input. In addition, to the extent that plants had their own training programs, employees may have been imbued with skills for which there was little other demand in a small labor market typified by a rural community. If this were the case, employees would not necessarily have internalized the benefits of training through wage gains due to competition as is commonly theorized. Also, over the time period studied, the plants may simply have been attempting to recoup the cost of their investment in training by reducing subsequent wage increases.

Community Variables

The variables measuring characteristics of the community labor supply were UNDERR and UNPTR. While both UNDERR and

UNPTR had the hypothesized negative sign, UNPTR was not significant.

UNDERR. Higher rates of underemployment were expected to have an inverse effect on family income gains because they indicate increased availability of employed workers capable of more skilled work. The relatively more abundant labor supply implied by the higher underemployment rate may result in suppressed wage rates. The significant coefficient for the underemployment variable suggests that with other factors in the equation held constant a 1% increase in the county rate of underemployment was associated with a $127 lower family income change for sample workers employed in that county.

UNPTR. This variable, measuring the combined rates of unemployment and potential labor force entry, was also expected to have an inverse relationship with family income changes because greater supplies of idle labor were expected to suppress wage rates. The estimated coefficient was -0.019 which implies that a 1% increase in combined unemployment and potential labor force entry was associated with a $19 decrease in employee family income. However, the estimated coefficient was not statistically significant.

Residence Status Variables

The series of discrete variables entered in the equation to measure the effect of residence status on family income changes were commuting (COMM), migrating (MIG), and return migrating (RMIG) workers where local workers were omitted. While each of the variables had the hypothesized sign, only return migrants had significantly different changes in family income, net of other factors, relative to local workers. Forty-nine percent of the employees in the sample were classified as local, 18% as commuters, 15% as migrants, and 17% as return migrants.

COMM and MIG. Commuters and migrants (nonlocals) were expected to have significantly higher income gains than local workers. It was expected that nonlocals would be younger, more educated, and more highly skilled than local workers and could provide skills unavailable at the local level and would need to recoup travel and migration costs as an incentive. Both COMM and MIG had the expected sign. The estimated coefficients indicate that, compared to local employees, the changes in family income for commuters and migrants, holding other variables constant, were greater by $203 and $328, respectively, but neither were statistically significant.

An examination of the data indicated that a number of the hypotheses regarding the characteristics of commuting and migrating workers were not supported in this sample. Commuters and migrants tended to be older and have only marginally higher levels of formal education than local workers. And the hypothesis that commuters and migrants tended to provide more skilled labor than local workers was partially contradicted by the fact that they were less likely to have been previously employed (an admittedly incomplete measure). Also, while commuters and migrants were employed in plants with marginally higher skill levels and in areas of lower unemployment and underemployment, they were employed in plants with lower relative size and wage levels than local workers (see Landes [6]).

RMIG. Return migrants were expected to have lower income gains than local workers because previous research has indicated that return migrants often sacrifice income in order to return to their home areas to live and work. The significant negative coefficient for RMIG supported this hypothesis. The coefficient is interpreted as meaning that, net of other factors in the equation, the families of return migrant workers in the sample had lower income gains than the families of local workers by the amount of $1,141.

Well-Being Status Variables (Q_1, Q_2, Q_4, Q_5)

Each of the discrete variables entered into the equation to measure the income gains of families by quintile of well-being in t_1 (Q_1, Q_2, Q_4,Q_5) was significant in the regression results. The sign and magnitude of the coefficients on these variables indicate the extent to which families in a particular quintile of well-being in t_1 gained or lost relative to those families in the third quintile due to family member employment in the sample plants. Variables Q_1 and Q_2 had positive coefficients, while Q_4 and Q_5 had negative coefficients. These results suggest that with other variables in the equation held constant, family member employment in the sample plants had an equalizing effect on levels of well-being within the sample of families.

SUMMARY

The analysis of factors influencing changes in family incomes associated with family member employment in the sample plants was the first step in this study of the primary round impacts of new manufacturing industry on the distribution of incomes in rural areas. The regression results support the baseline hypothesis of the conceptual model used in this study: that individual, family, plant, and community characteristics interact to determine how family incomes change due to new plant locations.

The most important group of explanatory variables in the model were those which measured changes in family labor force participation patterns. The highest family incomes and the greatest positive changes in family incomes were associated with families which changed from one spouse to both the husband and wife being employed. Moreover, the greatest losses in family income were associated with families losing a previously employed spouse. The net increases observed in this sample of families with both the husband and wife employed suggests that many rural families feel that they are not able to achieve an acceptable standard of living with only one spouse in the labor force.

Gains and losses of public assistance incomes were insignificant factors in explaining family income changes. While approximately 4% of the sample families gained some source of public assistance, 17% gave up public assistance payments due to family member employment in manufacturing plants. The percentage of sample families receiving unemployment compensation decreased from 16% in t_1 to 2% in 1977. The gain or loss of other sources of income was also significant with 14% of the sample families gaining and 1% losing some other source of family income between t_1 and 1977.

With the exception of the level of educational attainment, the demographic characteristics of individual workers did not prove to be highly significant, net of other factors, in the regression results. The analysis of these variables suggests that their role may be overshadowed by patterns of family labor force participation. Since the demographic characteristics were primarily hypothesized to influence the wage earning potential of individual workers, the role of these factors may be illuminated by further study of changes in employee wage earnings as opposed to family incomes.

Variables measuring the quality and quantity of labor demanded by new plants and labor supplied by rural communities were significant in the regression results. Larger plants offering higher relative wages appeared to contribute significantly to family income gains, net of other factors. Despite measurement problems associated with specifying community labor supply variables, county rates of unemployment and potential labor force entry and rates of underemployment contributed significantly to the results.

The significance of plant and community characteristics in affecting income changes suggests that policy-relevant information may be gained by further analysis of the impacts of various types of plants on different types of communities. And, the dominant role of family labor force participation patterns in explaining family income changes suggests that more attention be given to the interactions between plant and community variables which affect these patterns.

While workers classified as return migrants had significantly different income changes from local workers, commuters and migrants did not. The fact that 33% of the workers sampled were commuters and migrants suggests, however, that these groups compete extensively with local workers for new jobs. The results have shown that migrants and commuters were not homogeneous groups and were not necessarily employed in larger, higher wage plants than local workers, as hypothesized. Also, the expected greater family income gains for commuters and migrants may have been masked by tendencies for increased family labor force participation in these groups. Further analysis of the interactions between changes in employee wage earnings, plant characteristics, and commuting and migration may lead to better understanding of the factors differentiating local and nonlocal workers.

The regression results reflect an equalization of levels of well-being within the sample families. But, further analysis is needed to assess the direct impact of employment in the sample plants on the distribution of incomes within the sample communities as a whole, and to assess the extent to which this sample of new rural manufacturing firms has succeeded in bringing families out of poverty. A preliminary analysis of this topic based on the same data is presented in the next section.

DISTRIBUTION OF FAMILY INCOMES AND ALLEVIATION OF POVERTY

In the previous section, the objective was to evaluate factors which influenced changes in family income due to employment in new rural manufacturing plants. In this section the second objective, evaluation of the primary round impacts on the distribution of family incomes and alleviation of poverty within the sample communities, is addressed.

Primary Round Distribution of Family Incomes

Analysis of community distributive impacts involved determining the placement of sample employee family incomes within an agregate family income distribution based on Census data and specified in quintiles for the community. The frequency of sample families in each quintile for t_1 (the year prior to employment in a sample plant) was evaluated with respect to a similar frequency count for 1977.

To conduct the analysis, a number of intermediate steps and assumptions were required. The first step was to estimate quintile ranges of the aggregate family income distribution for the 24 sample counties using 1970 Census data. The reason for combining the 24 sample counties into one aggregate distribution was that there were not necessarily enough plant or employee observations in each county to allow analysis on a county-by-county basis.

Census data from 1970 were used because it was the most recent source of reliable data. The 1970 Census data provided the number of families in each county within 15 income categories. The frequencies for each category were summed across the 24 counties and the resulting totals were used to calculate a cumulative percentage distribution. This distribution was then divided into quintiles with ranges estimated by linear interpolation.

Because individual workers could have become employed in a sample plant anytime between 1970 and 1977, t_1 employee family income for each employee was adjusted to the 1977 price level to control the influence of changing price levels. Moreover, the aggregate 24-county income distribution estimated from 1970 data was also adjusted to 1977 price levels. The purpose of doing so was not to allow comparisons between the sample and the 24-county population but instead to provide a bench mark, in terms of real income, with which the distribution of sample family income changes could be evaluated.

The 1977 family income level which divided the first and second quintiles of the aggregate distribution was estimated to be $4,804. Comparable boundaries for the second and third, third and fourth, and fourth and fifth were $8,701, $12,701 and $18,079, respectively. Charts in Figure 2 show the percent frequency distributions of sample family incomes within the quintile ranges in t_1 and 1977.

Figure 2 shows that prior to employment in sample plants (t_1), a disproportionate share (80%) of employees had family incomes which placed them in the middle three quintiles. Sample employees were most heavily represented in the second quintile and were underrepresented in the first and the fifth quintiles.

After employment in the sample plants (1977), sample families were still overrepresented in the middle three quintiles and underrepresented in the first and fifth quintiles. However, the distribution changed considerably. The percent in the first quintile decreased from 14% in t_1 to 1% in 1977 and the percent in the first two quintiles decreased from 46% to 23%. On the other hand, the percent of sample families in the fourth and fifth quintiles increased from 30% to 50% from t_1 to 1977. Two notes of caution in addition to the already noted methodological assumptions should be made concerning interpretation of the above figures. First, the examination of family income changes included only the primary round effects of new manufacturing employment. No inferences were made concerning secondary effects. Second, interpretation must be limited to the scope of the sample. Recall that supervisory and management employees and certain observations which indicated a t_1 total family income of zero from all sources were omitted.

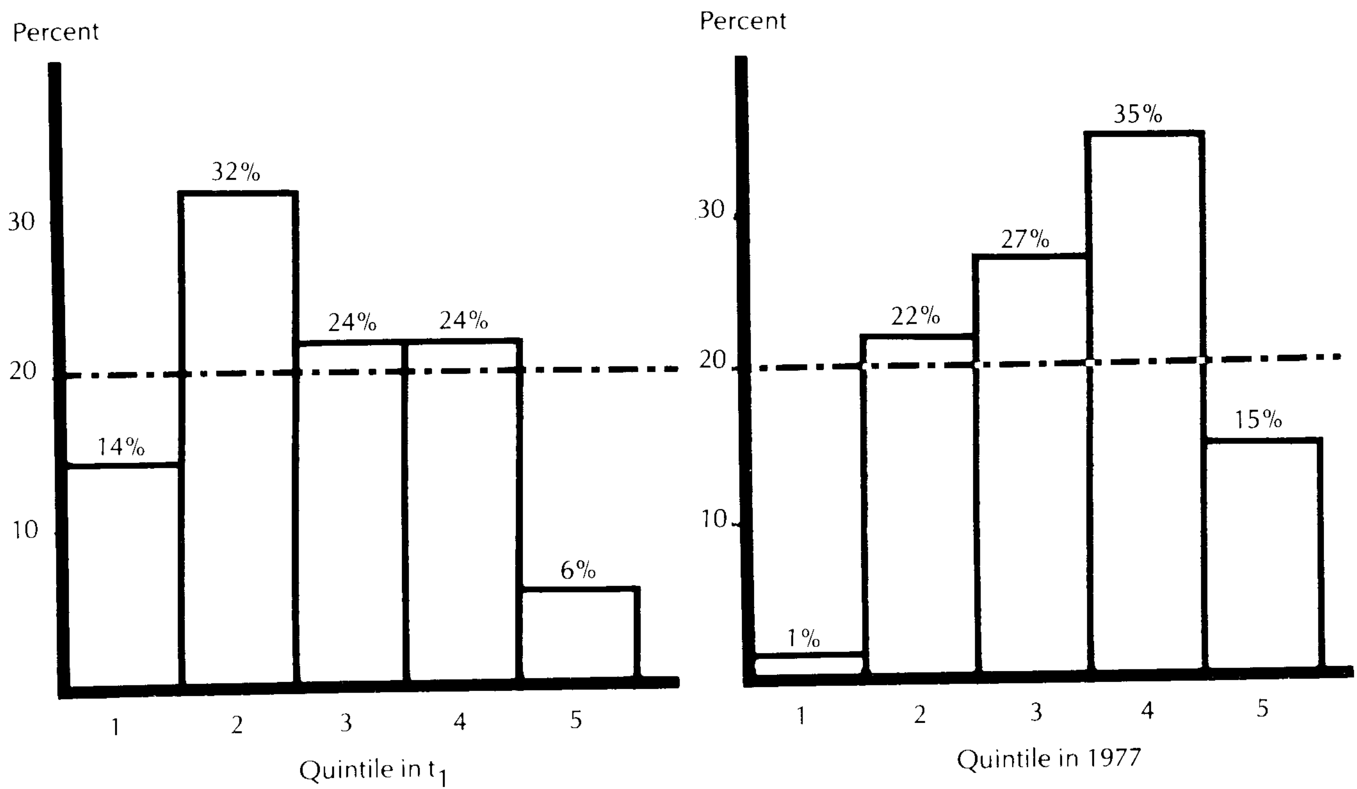


Figure 2. Percent Frequency Distributions of Sample Family Incomes by Quintile in t_1 and 1977.

Primary Round Impacts on the Alleviation of Poverty

In the previous section, family incomes were not adjusted for age or family size. Therefore, the results did not necessarily address the issue of poverty alleviation. In this section, families were categorized as being in poverty or not by using definitions from the 1970 Census which included family attributes of age and size. Again, incomes were adjusted to 1977 price levels. Overall changes in poverty status of sample families between t_1 and 1977 are reported and the influence of residence status and family labor force participation are examined.

The incidence of poverty among sample families in t_1 and 1977 is shown in Figure 3. Of 565 observations, 487 (86%) were not in poverty in t_1 while in 1977 540 (96%) were not in poverty. The 10% decrease in the incidence of poverty was a result of shifts both into and out of poverty between the two periods. Of the 78 families which were in poverty in t_1, 65 escaped by 1977 while 13 remained in poverty. Of the 487 families not in poverty in t_1, 475 remained out of poverty while 12 entered the poverty classification.

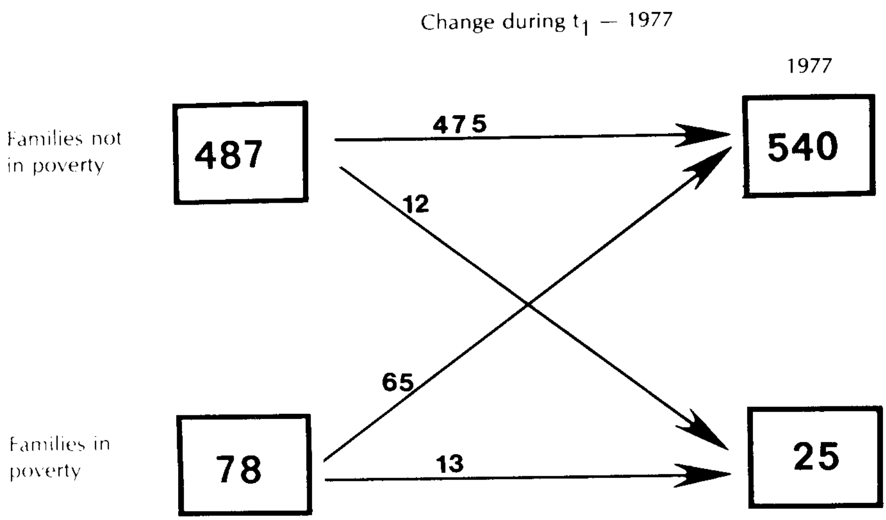


Figure 3. Frequencies of Family Poverty Status and Changes Between t_1 and 1977.

Poverty Status Among Local and Nonlocal Families

To further examine the poverty status of sample families, the incidence of poverty by residence status was tabulated. Results are presented in Table 5. Of the 555 families for which residence status information was available, 275 were local, 100 were commuters, 86 were migrants, and 94 were return migrants. Migrants and return migrants had the highest incidence of poverty in t_1, 19% and 18%, respectively. Comparable figures for local families and commuters were 13% and 8%, respectively. In 1977, the return migrant group had 8% in poverty while migrants, locals, and commuters had 6%, 4% and 1%, respectively. In terms of net movement out of poverty, migrant families had the highest percent (13%) followed by return migrants (10%), local families (9%) and commuters (7%).

Table 5. Incidence of Poverty Status in t_1 and 1977 by Residence Status of Sample Family

Change in family poverty status	Local (%)[b]	Commuter (%)[b]	Migrant (%)[b]	Return migrant (%)[b]	Total[a] (%)[b]
Poverty (t_1)—poverty (1977)	5 (2)	0 (0)	4 (5)	4 (4)	13 (2)
Nonpoverty (t_1)—poverty (1977)	6 (2)	1 (1)	1 (1)	4 (4)	12 (2)
Poverty (t_1)—nonpoverty (1977)	31 (11)	8 (8)	12 (14)	13 (14)	64 (12)
Nonpoverty (t_1)—nonpoverty (1977)	233 (85)	91 (91)	69 (80)	73 (78)	466 (84)
Total	275	100	86	94	555

[a]Frequencies are not the same as those shown in Figure 3 because some observations have missing values for family residence status.

[b]Percentages refer to column totals.

Poverty Status Associated with Family Labor Force Participation

The change in poverty status associated with family labor force participation is shown in Table 6. Of the 555 families for which labor force participation data were available, 50 had a net loss of one worker, 369 had no change, 135 added one worker and one added two workers. In percentage terms, there was little difference in the number of families staying in poverty or moving into poverty among the labor force participation change categories. It should be noted, however, that nine of the 10 observations excluded because of missing labor force participation data stayed in or moved into poverty.

Table 6. Incidence of Poverty Status in t_1 and 1977 by Change in Labor Force Participation of Sample Families

Change in family poverty status	Change in number of workers per family: +1[a] (%)[c]	0 (%)[c]	-1 (%)[c]	Total[b] (%)[c]
Poverty (t_1)—poverty (1977)	1 (1)	9 (2)	1 (2)	11 (2)
Nonpoverty (t_1)—poverty (1977)	0 (0)	4 (1)	1 (2)	5 (1)
Poverty (t_1)—nonpoverty (1977)	27 (20)	37 (10)	0 (0)	64 (12)
Nonpoverty (t_1)—nonpoverty (1977)	108 (79)	319 (86)	48 (96)	475 (86)
Total	136	369	50	555

[a]Includes one family that added two workers.

[b]Frequencies are not the same as those shown in Figure 3 because some observations have missing values for labor force participation.

[c]Percentages refer to column totals.

The most noticeable difference in the labor force change groups was in the percent of families that moved from poverty in t_1 to nonpoverty in 1977. In the group of families which added a worker to the labor force, 21% were in poverty in t_1 and only 1% were in poverty in 1977. In comparison, among the families with no net change in the number of workers, 12% were in poverty in t_1 and 3% were in poverty in 1977. Little change in poverty status occurred within the group which had a net loss in the number of workers in the family.

Further analysis of the 64 families which moved out of poverty indicates that female workers played an important role in the change of status. Table 7 shows the composition of family work forces in t_1 and 1977 for the families which escaped poverty during the period. Of the 64 families, 15 changed poverty status with only a male working in t_1 and 1977 and 19 changed status with only a female working. One family escaped poverty with both a male and female entering the work force while 20 were associated with a female entering the work force and nine were associated with a male entering the work force. In the 64 families, 29 males and 26 females were working during t_1. After escaping poverty (1977), 38 males and 45 females were working.

Table 7. Comparison of Family Work Force Participation for Families Which Escaped Poverty Between t_1 and 1977

Family workers in t_1	Family workers in 1977			
	Male only	Female only	Male and female	Total
None	2	6	1	9
Male only	15	1	13	29
Female only	2	19	5	26
Total	19	26	19	64

Summary

The analysis of distributive impacts indicates, within the methodological assumptions, that families with workers employed in the sample plants achieved considerable relative income gains within the sample counties. However, lacking a control group, there is not conclusive evidence that sample families have greater income than they would have had without becoming employed in the sample plants. While most sample families were concentrated in the middle of the aggregate distribution, it cannot be automatically concluded that the new manufacturing jobs contributed to a more nearly equal aggregate distribution of income, either in a local or regional sense, because relatively few of the sample families were from the lowest income quintile.

The investigation of the effects of family member employment in the sample plants on the alleviation of poverty tends to support the implications of the distribution analysis. While most of the previously poor sample families in the sample escaped poverty after employment, comparatively few, 14%, of the sample families were previously poor. The analysis of poverty impacts suggests, as did the regression analysis findings, that working female spouses played an important role in helping the sample families escape poverty and stay out of poverty.

IMPLICATIONS

The findings of this study suggest that primary consideration in assessing the distributive impact of new rural manufacturing industry be given to factors which promote and inhibit the labor force entry of family members. With high levels of underemployment prevalent in the rural labor markets, many families must place additional family members in the work force to achieve substantial income gains and acceptable levels of income.

There are functional problems which may inhibit the ability of many families to place members in the manufacturing work force and, therefore, limit family potential to achieve relative income gains. Older families are not as likely to have family members enter the labor force. This may be due to the inability of older workers to compete effectively in the labor force. They may also be at life stages that are less conducive to having multiple members of the household in the labor force, or have less perceived need for additional income. Younger families may also have limited potential to add females to the work force because of child rearing. A more pervasive but less well-defined problem is evidenced by the under-representation in the sample of families with very low income and/or no member in the labor force prior to employment in the sample plants. It would seem that such families, unless voluntarily poor, would have had at least as much incentive to participate in new manufacturing employment as families with relatively greater incomes. The relative absence of employees from poor families suggests that the potential for job entry is somehow limited for such persons. They may lack the necessary human capital to participate in new employment opportunities. While this conclusion may be the result of sample bias, the implication is still clear that new manufacturing industry must provide opportunities for low-income families and workers with little or no industrial work experience if it is to contribute to substantial distributive gains in rural communities.

Direct interpretation of the regression coefficients for plant variables indicates that relatively large plants, paying relatively high wages and requiring little skilled labor, contribute to greater income for families of workers. However, since plants with such characteristics are not widely available, these results do not suggest a realistic industrialization policy. A more realistic interpretation, which is consistent with the conclusions of the analysis, is that rural communities need to promote an industrial structure which is more diversified in terms of skills required and wages offered. The negative coefficient for the skill variable must be interpreted in light of the limited range of skill requirements observed in the sample plants. Previously unemployed workers tend to be employed in relatively low-wage and low-skill plants indicating that these plants are valuable in providing opportunities for inexperienced workers and, perhaps, low-income families. But skilled and semi-skilled jobs, offering higher wages, are required to enable workers to become more fully employed and to achieve substantial gains in earnings. The analysis suggests that many of the rural workers studied, and particularly the males, did not have the opportunity to become more fully employed. Higher skill plants would provide such an opportunity. Job training programs which enable workers to fill more skilled positions with less cost to the firm would appear to be an important component of a policy by state and local governments which seeks to attract more skilled industry and to directly benefit workers.

The distinction between male and female labor markets observed in this study also suggests important implications for community industrialization policy. Plants which enable females to become employed or more fully employed are especially important for family income gains. In this situation the effectiveness of creating more and better jobs for females as a means of helping low-income families would depend on factors, including age, ability and child rearing duties, which may affect the ability of females to take these jobs. Plants which enable males to become employed or more fully employed are important to help families that are not able to add female spouses to the labor force. The creation of more skilled jobs for males and females may alleviate the need for families to have two family earners and may result in a greater availability of vacated jobs for other families.

The extent to which underemployment in rural labor markets is voluntary or involuntary is not resolved in this study. The implications of voluntary and involuntary underemployment would appear to be different. If underemployment is largely involuntary, resulting from sporadic layoffs and/or insufficient opportunities to improve skills and wage earnings, then the promotion of a more diversified industrial structure and job training programs would appear to be an effective policy for achieving both income gains and distributional equity. If underemployment is largely voluntary, resulting from sporadic labor force participation and/or reluctance to improve skills and earnings, then these policies may be ineffective.

The findings of this study indicate that nonlocal workers compete extensively with local workers for jobs and income gains stemming from the location of new manufacturing plants. But the heterogeneity of nonlocal groups in terms of the types of employment they seek suggests that the types of industry locating in a community, at least within the range of size, skill, and wage levels included in this sample, will not necessarily affect the degree to which available jobs will be filled by local or nonlocal groups. The heterogeneity observed among nonlocal groups also indicates that more attention needs to be given to the definition and characteristics of nonlocal groups so that their impacts on local labor markets can be more effectively estimated.

The implication of the description of primary round distributive effects of employment in the sample plants, while perhaps biased by the sample of workers obtained, is that new manufacturing industry is not a panacea for solving poverty or income distributional problems in rural communities. This finding indicates that more attention may need to be given to variables and policies which affect the distributive impact of new manufacturing industry in rural areas.

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