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ABSTRACT

In order to determine the effect of rural industrial development in an historically rural area of Illinois, a stratified area probability sample survey of 781 household heads in an area experiencing limited industrial development and of 315 household heads in an area lacking industrial development was conducted in 1966. The results of this survey were compared with a similar 1971 survey (1,171 and 399 responses from the experimental and control areas respectively). Variables examined were: (1) Income (earnings and additional income of household heads and income of other household members); (2) Social Characteristics (% female-headed households, years of education, family size, status of current job, and age); (3) Group and Type of Income (female and male-headed households, farm and nonfarm households, household heads 65 years or older and those under 65 years); and (4) Social and Income Characteristics by Length of Residence. Findings indicated that development: (1) did not have a dramatic effect on level of income; (2) increased equality of income; (3) substantially and adversely affected the elderly; (4) adversely affect the average earnings of female household heads but positively affected female household heads but positively affected female income per dependent; (5) did not create a greater rate of in-migration (immigration appeared to increase median earnings and decrease income equality, as immigrants were of a higher socioeconomic strata). (JC)

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Affluence, Equality, and Equity:

A Case Study of Rural Development and Economic Status

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Affluence, Equality, and Equity:
A Case Study of Rural Development and Economic Status

In the past two decades, a great deal of effort has been made by rural communities to attract industry to their areas. The impetus stimulating this desire to bolster the community's economy usually stems from trying to cope with long-standing problems of decay of employment in agriculture and agriculturally related services. Historically with this decline has come an increase in out-migration of labor, unemployment and underemployment. It is believed that community success in recruiting industry would provide employment opportunities, and as a result reduce out-migration, raise personal income, and broaded the community's tax base (Summers, et al., 1975; Tweeten, 1974). This expectation is supported by a growing case-study literature on the economic gains accruing to rural communities which have been successful in enticing industry to locate in their areas.[1] Typically, this optimistic view of development has been founded on investigations of changes over time in "average" income (usually per capita income or median family income) in communities or counties in which industry has settled. Using this criterion for economic benefit, there is evidence to suggest that industrial development is a desirable community goal that should be sought.

Certain expectations are commonly held concerning the relationship between industrial development and level of income. When industry locates in rural areas it is expected to have two major consequences: first, it will create a demand for labor for the construction and operation of the new facility; and secondly, since the industry will be introducing additional monies into the local economy through increased payrolls and taxes, it should indirectly stimulate the growth of jobs in other industries and services.

Based on a review of 18 case studies of rural development by Summers and associates (1975), it is estimated that each new job in industry can be expected to generate approximately 0.30 additional jobs outside the industry. This direct and indirect demand for labor should provide job opportunities for the residents, and as a result reduce unemployment and underemployment. This should tend to raise, then, the "average" income within the developing region. Since it is anticipated that development will have relatively larger effects on lower income groups, increases in the level of income may simultaneously tend to reduce the inequality in its distribution (Merriam, 1968:722). While there are several problems with this uncluttered theory (see Anderson, 1964; Bender, et. al., 1971), we will consider in detail only those issues which bear on the distribution of the economic gains from development.

It is useful to make the conceptual distinction between income inequality and income inequity. While the latter incorporates a notion of "just returns on an investment", the former implies only a certain "sameness" of income. Even if we assume that development decreases inequality, all this suggests is that there is a creation of a more homogeneous income structure in the developing region. A case can be made that the important issue does not involve income homogeneity, but rather revolves around the question concerning the relationship between development and income inequity.

Equity can be seen from two slightly different, although not unrelated, perspectives. First, from a human capital view, there is income equity if the rate of return on human investment (schooling, employable skills, work experience, etc.) is the same for all members of the population.[2] If there is equity in a social system, there is no reason to suspect that there will also be income equality, unless the distribution of investment is uniform across the population. Hence, discovering that development has caused a reduction

in inequality does not necessarily mean that the social system is more equitable. From a second perspective, we can use equity to denote a "just" relationship between those who bear the costs of development, however indirectly, and those who gain the benefits. In this sense, the resident population may make substantial concessions to lure industry into the area, but may not benefit directly from its presence.

To determine, then, the degree of income inequity in a social system we must know not only the nature of the investment-benefit function, but also the allocation of investment within the system. While such a precise assessment is beyond the scope of this paper, we can ask the question of the extent to which those persons who bear the costs of industrial development by making concessions to attract new industry are the same people who reap the benefits. If this concept of equity is central to the evaluation of rural development, as we believe, then using changes in "average" income in the developing community as the criterion for success may well be inadequate. Now let's consider some of the sources of inequity and their relationship to industrial development.

First, it is often implicitly assumed that the community is a closed social system which is unaffected by basic migratory processes. There is evidence that bringing industry into the community will encourage an in-migration of excess labor from other locations and that many of the newly created jobs will be filled by these "newcomers" (Peterson, 1974:114; Kuehn, et. al., 1972; Olsen and Kuehn, 1974). It is quite possible that such in-migration will benefit the "community" but not the persons residing in the area prior to development. For example, a comparison of the "average" income before and after development may indicate substantial increases, yet these may not have been realized by the longer-term residents who paid, however indirectly, for

the development, but by the newcomers who migrated because of the increased demand for labor. In this sense, inspecting cross-sectional data collected at two or more points in time will not reveal that those persons living in the developing community have not shared in the proclaimed economic gains.

Even if there is little or no migration, considering only increases in "average" income may disguise any inequality and inequity in the distribution of benefit. The proposition that development tends to increase income equality notwithstanding, it must be recognized that there is no evidence to suggest that the economic benefits due to development are equally or equitably distributed across all segments of the population within the community. In particular, it may be the case that certain subgroups (the elderly and any racial/ethnic minorities, for example) are in more of an economically disadvantageous position after development than before.

In addition to these issues there are measurement complications as well.[3] Income can be minimally partitioned into earnings and cash transfers. This latter category includes such components as pensions and retirement payments, Social Security, public assistance such as unemployment compensation or ADC benefits, alimony, interest on savings, dividends on stocks and bonds, and so on. When median family income is chosen as the appropriate measure of gain, it is not possible to determine whether changes over time are produced by variation in cash transfers or in earnings or in both. Secondly, it is well-known that much of the variation in income, of both types, is linked directly to the family's position in the life cycle (Kuznets, 1955). Again apparent changes in "average" income may be due to factors external to the industrial development process.

It is our position, then, that to argue that industrial development is beneficial on the evidence that the community's per capita income, say,

increases over time overlooks what may be one of the most salient factors in rural development, viz., the possible unequal and unequitable distribution of economic gains within the community. Clearly, there is no assurance that any increased income generated by development will be equally distributed among the community's population, or that certain segments of the population will find themselves in a worsened relative economic position afterwards, or that the persons paying the largest share of the cost will be the ones who reap the benefits deriving from development.

In this paper, we will consider some of these issues by exploring changes in the distribution of income over time in a developing area of northcentral Illinois. Although essentially a case-study, it is hoped that the quasi-experimental nature of the research design will allow a close inspection of some of the issues presented here.

Description of the Study Areas[4]

The purpose of the study was to monitor changes in an historically agrarian area, the "experimental" area, which was undergoing limited industrial development. The experimental region is located along the Illinois River approximately 100 miles southwest of Chicago. It is about 315 square miles in area and is composed of Putnam County, four townships of Bureau County, one township in Marshall County, and the town of Oglesby in LaSalle County. In 1960 there were 53,734 people residing in the experimental region. Prior to 1965 the area was predominately agricultural with the other economic sectors supporting and complimenting this agrarian base.

In April, 1965, plans were announced by the Jones-Laughlin (J&L) Steel Corporation for the construction of a large-scale, highly automated production

facility near the village of Hennepin in Putnam County. Construction of a cold rolling mill was started in June, 1966 and completed in December, 1967. Initially J&L employed approximately 700 workers, but by 1971 roughly 1000 workers were employed, most of which were blue collar.

In order to provide a base for comparison, a "control" region was selected which was not undergoing industrial development. This control is in Iroquois County, Illinois. It is approximately 222 square miles in area and is located along the Indiana border about 100 miles south of Chicago. Six townships--Belmont, Concord, Iroquois, Middleport, and Sheldon--and Watseka, the county seat, make up this region. In 1960, the control area had a population of 10,640. The economic base of this area is almost exclusively agricultural, however it has somewhat of a more integrated, self-contained economic system than was found in the experimental region.

In 1966, a stratified area-probability sample survey of heads of households was conducted in the experimental and control regions. The survey yielded 1,096 interviews--781 in the experimental region and 315 in the control. After appropriate weighting for differential sampling fractions, a total of 1,600 observations were obtained--1,171 from the experimental and 429 from the control.

In the summer of 1971, a new area-probability sample survey of heads of households was conducted. 1,052 interviews were completed and after weighting a total of 1,570 observations--1,171 from the experimental and 399 from the control--were available for analysis.

Data from the 1966 and 1971 cross-section surveys provide independent descriptions of the two regions at two points in time. Using this data, it is possible to estimate what changes, if any, have occurred in the study areas during the five year research period.

Measurement

Income Variables. Two concepts of money income are used to trace changes in economic status in the two areas. The earnings of the head of household was used to measure increases or decreases in the amount of money income received as a result of changes in employment status. Regional differentials on this variable can be attributed to changes in the economic base of the experimental region due to the indirect and direct effects of the J&L facility.

We were also interested in changes in the standard of living at the household level. A rise in earned income does not necessarily lead to an improvement in living standards if that segment of the population which is experiencing a rise is also at a stage in the life cycle where a greater number of dependents must be supported. Income per dependent in the household (Total Family Income/Family Size) was used as a measure of the income resources available to each family member, and indirectly as a measure of family affluence.

In the 1966 cross-section survey information on the (1) earned (salaries and wages) income of the head of household for the year 1965, (2) additional income received by the household head for 1965, and (3) any income received by other members of the household was obtained. Income per dependent was created by summing the income received from all three sources, and then dividing by the number of people in the household in 1966.[5]

The 1971 survey used a greater number of income items. Data was collected on six sources for both the head and spouse of the household. Since we were interested in changes in real income over time, all data on these items were converted into their 1965 dollar equivalences. A measure of the head of household's earned income was computed by aggregating income received from three sources: (1) wages or salaries (including commissions, bonuses, and

tips); (2) income from nonfarm businesses, professional practices, or partnerships; and (3) income from farm products and labor.

A measure of the additional income received by the head in 1970 was created by summing the income received from (1) Social Security or railroad retirement; (2) from public assistance or welfare, and (3) from any other sources. Finally, income received by other household members was calculated by summing the income received from all of the six sources by the head's spouse.

As was done for the 1966 data set, per dependent income was computed by summing the earned income of the head, additional income of the head, and income received by the head's spouse. This sum was then divided by the number of persons living in the household in 1971.

Since total family income, and therefore income per dependent, is composed of three components, it is clear that two households may have identical total family incomes, yet the composition of these may be very different. Data in Table 1 show that roughly two-thirds of the aggregate income is from earnings, close to a fifth is due to the income of other family members, and about a tenth is from additional income of the head of household. While these proportions are approximately the same in each region for each survey, there is a noticeable trend in both regions for the proportion due to the head's earnings to increase over time. Since there is no apparent regional difference in this trend, we can not conclude that the observed shifts in composition are related to industrial development.

There are, however, reasons for suspecting that the changes in composition of aggregate income are a result of the different measurement methodologies employed in the two surveys. First, in 1966 the respondents were asked to estimate any additional income they had in 1965, and to estimate the total

Table 1

Decomposition of Aggregate Income

Source	1965 Income		1970 Income	
	Experimental	Control	Experimental	Control
Earnings of Head of Household	69.6%	72.1%	75.8%	75.2%
Additional Income of Head of Household	7.4%	7.1%	9.5%	10.6%
Income of Other Members of Household.	22.9%	20.7%	14.6%	14.1%
Total	99.9%	99.9%	99.9%	99.9%

income of all other members of the household. In the 1971 survey, however, a different procedure was employed; the respondents were presented with a list of six possible income sources, then were asked to estimate the amounts of income received from each source. This approach was repeated for the head's spouse, if applicable. Hence, in the first survey we explicitly asked for income of all other family members whereas in 1971 we only included income from the spouse. Although it is reasonable to believe that the largest proportion of other members' income is due to the spouse, it is certainly not the only contributing factor to this component. It is likely, then, that we underestimated the magnitude of other family members' income in 1970.

Secondly, since in the last survey we enumerated possible sources of additional income of the head, it is likely that the respondents were prodded into remembering income that they might have otherwise overlooked. As a consequence, it is possible that we underestimated the amount of head's additional income in 1965. These two measurement problems could account for the pattern

noted in Table 1.

Inequality and Inequity. Many indices of inequality have been proposed and criticized (see Alker and Russett, 1964; Metcalf, 1972:8-25; and McCall, 1973:55-99). In this paper we chose to use the standard deviation of the distribution of log income as an indicator of income inequality.

A crude indicator of inequity among subgroups is based on the notion of relative shares of income. This measure, percent relative share, is the ratio of "excess" income received by a group to the group's relative size in the population,

$$\% \text{ Relative Share} = \frac{\text{Share of Income} - \text{Group Size}}{\text{Group Size}} \times 100.$$

To illustrate, in the experimental region in 1966 non-farm families represented 90.0% of all families in our sample, yet they received 91.2% of the total 1965 family income in that region. Hence the % Relative Share for these families is [(91.2 - 90.0)/90.0] x 100, or +0.2% more of the total family income than they "should" have on the basis of their relative size in the sample of all families.

These two measures, the standard deviation of log income and percent relative share, are used, then, to indicate the degree of inequality in a distribution of income and the inequity in the allocation of incomes among groups within each region.

Other Variables. Besides the income variables, several socially relevant factors were measured.

Age and sex of head of household were determined directly from the interview instrument.

Level of educational attainment of head of household was ascertained by asking the head to report the greatest number of years of formal education received at the time of the survey.

Family size was taken as the total number of persons, excluding the respondent, living in the household at the time of the survey.

Occupational status of head of household was measured using the Duncan (1961) socioeconomic index (SEI).

Residential location was part of a ten-year migration history obtained from each household in 1971. This variable is used to partition the 1971 survey into (1) those respondents who have been living continuously since 1965 in either region and (2) those who have migrated into either region since 1965.

Description of the Samples. Table 2 tabulates many of the socially relevant characteristics of the samples drawn in each region during the 1966 and 1971 cross-section surveys. The regional comparability in the first survey is

Table 2

Social Characteristics of the Samples

Characteristics	1966 Survey Experimental	1966 Survey Control	1971 Survey Experimental	1971 Survey Control
% Female-headed Households	18.8 (n=1171)	20.9 (n=429)	21.0 (n=1166)	21.0 (n=402)
Mean Family Size	2.1 (n=1171)	2.2 (n=429)	2.1 (n=1166)	2.0 (n=402)
Mean Years of Education	10.8 (n=1170)	10.6 (n=428)	11.2 (n=1156)	10.9 (n=402)
Mean Status of Current Job	35.3 (n=1067)	36.5 (n=392)	38.3 (n= 875)	34.1 (n=306)
Mean Age	51.2 (n=1171)	49.6 (n=429)	49.9 (n=1165)	51.9 (n=402)

particularly striking, the two regions are virtually identical in regard to mean family size, mean number of years of educational attainment, and mean

age. There are a few more female-headed families in the control area, and there is a one point difference in the mean status of current job, but these discrepancies are minor. Looking at regional differences in 1971, however, we find some rather significant changes. Although the regions are quite comparable in many respects, there has been an increase in the mean level of occupational status in the experimental region accompanied by a decrease in the mean status in the control. Further, while in 1966 the experimental area's sample was slightly older than the control's, this situation is reversed in 1971.

Analysis

Regional Comparisons. Table 3 presents the characteristics of the regional distribution of earnings and income per person in 1965 and 1970, and a measure

Table 3

Income of Heads of Households
(In 1965 Dollar Units)

Type of Income	1965 Income		1970 Income		Net Effect
	Experimental	Control	Experimental	Control	
Earnings					
Median	$5,790.43	$5,888.43	$5,377.35	$4,692.03	$783.32
Standard Deviation of Log Income	0.798	0.800	0.881	0.917	-0.034
N	1127	408	1082	393	
Per Dependent Income					
Median	$2,452.91	$2,575.00	$2,089.55	$2,000.00	$211.64
Standard Deviation of Log Income	0.789	0.769	0.827	0.836	-0.029
N	1150	419	1166	402	

of the net effect of development. This net effect is defined as:

$$\text{Net Effect} = (I_e^{70} - I_e^{65}) - (I_c^{70} - I_c^{65})$$

where I_e^t is the median income, say, of the experimental region at time t and I_c^t is the comparable median in the control. Clearly, if the changes over time in both areas are equal the net effect will be zero.

From Table 3 it was found that the net effect of industrial development was to increase the median earnings by $783.32—a notable 13.5% aggregate gain. There was a modest concomitant decrease of 4.2% in the level of income inequality. In terms of family affluence it is noted that the gains here are more moderate: there is a $211.64, or 8.6%, gain in median per dependent income attributable to development and a small 3.7% reduction in inequality. Based on these aggregate data we conclude that there is positive evidence that industrial development in the experimental region tended to increase earnings and reduce inequality, although these effects were not large. This same trend is manifest when considering family affluence even though the effects on family well-being are even more modest than on individual incomes.

As we contended previously, conclusions based on comparative analyses of "average" income may be misleading. For the reasons cited before, it is important to take a closer look at these findings by briefly considering the impact of development upon a few selected subgroups within the experimental region.

Some Further Comparisons. Table 4 gives the characteristics of the distributions of earnings and income per dependent for female-headed households, male-headed households, farm households, nonfarm households, households headed by someone 65 years old or older, and households whose head is under age 65.

Considering sex differences it was found that female-headed households experienced a $185.24, or 7.4%, net loss in earnings due to industrial develop-

Table 4

Income Characteristics for Selected Groups
(In 1965 Dollar Units)

Group/Type of Income	1965 Income Experimental	1965 Income Control	1970 Income Experimental	1970 Income Control	Net Effect
Female-Headed Households					
Earnings					
Median	$2,499.99	$2,173.90	$1,879.13	$1,738.28	-$185.24
Standard Deviation of Log Income	0.706	0.796	0.637	0.573	0.154
% Relative Share	-49.7%	-47.4%	-56.9%	-62.4%	
N	202	80	227	89	
Per Dependent Income					
Median	$1,939.02	$2,576.92	$1,611.11	$1,722.22	$526.79
Standard Deviation of Log Income	0.824	0.921	0.882	0.812	0.167
% Relative Share	- 9.6%	+5.4%	-12.9%	-19.3%	
N	216	85	245	92	
Male-Headed Households					
Earnings					
Median	$6,362.58	$6,540.18	$6,329.05	$6,123.18	$383.47
Standard Deviation of Log Income	0.742	0.706	0.828	0.872	-0.080
% Relative Share	+10.8%	+11.6%	+15.0%	+18.2%	
N	925	328	855	304	
Per Dependent Income					
Median	$2,554.97	$2,574.71	$2,235.29	$2,151.51	$103.52
Standard Deviation of Log Income	0.777	0.727	0.802	0.837	-0.085
% Relative Share	+ 2.2%	- 1.4%	+ 3.4%	+ 5.7%	
N	934	334	920	310	
Farm Households					
Earnings					
Median	$5,401.78	$6,875.00	$5,500.00	$4,843.75	$2,129.47
Standard Deviation of Log Income	0.905	0.929	0.809	0.855	-0.022
% Relative Share	+ 1.0%	+33.6%	- 1.4%	- 9.4%	
N	103	50	56	61	
Per Dependent Income					
Median	$2,566.67	$2,666.66	$2,250.00	$2,000.00	$349.99
Standard Deviation of Log Income	0.823	0.861	0.865	0.812	0.091
% Relative Share	+1.0%	+13.6%	0.0%	- 6.9%	
N	105	54	59	62	

Table 4 Continued

Group/ Type of Income	1965 Income Experimental	1965 Income Control	1970 Income Experimental	1970 Income Control	Net Effect
Nonfarm Households					
Earnings					
Median	$6,026.93	$6,133.18	$6,609.38	$6,443.95	$271.68
Standard Deviation of Log Income	0.762	0.713	0.709	0.809	-0.149
% Relative Share	- 0.1%	- 5.2%	+10.7%	+ 2.4%	
N	930	323	749	239	
Per Dependent Income					
Median	$2,505.35	$2,677.21	$2,285.04	$2,275.86	$181.04
Standard Deviation of Log Income	0.776	0.734	0.800	0.811	-0.053
% Relative Share	- 0.1%	- 2.2%	0.0%	+ 1.8%	
N	945	329	818	244	
Head of Household 65 or Older					
Earnings					
Median	$1,919.35	$1,800.83	$1,568.50	$1,695.20	-$245.22
Standard Deviation of Log Income	0.712	0.706	0.639	0.940	-0.307
% Relative Share	-55.5%	-59.1%	-60.6%	-30.7%	
N	238	85	261	99	
Per Dependent Income					
Median	$1,831.57	$1,884.61	$1,736.55	$1,822.22	-$ 32.63
Standard Deviation of Log Income	0.856	0.925	0.846	0.884	0.031
% Relative Share	-15.0%	-13.2%	-11.6%	+12.9%	
N	254	92	281	100	
Head of Household Under 65					
Earnings					
Median	$6,483.63	$6,627.15	$6,434.25	$5,905.78	$671.99
Standard Deviation of Log Income	0.660	0.623	0.755	0.809	-0.091
% Relative Share	+14.9%	+15.5%	+19.2%	+10.3%	
N	889	323	830	294	
Per Dependent Income					
Median	$2,619.04	$2,728.91	$2,215.85	$2,115.94	$209.78
Standard Deviation of Log Income	0.756	0.703	0.815	0.820	-0.058
% Relative Share	+ 4.2%	+ 3.7%	+ 3.7%	- 4.3%	
N	896	327	884	302	

ment, yet we also found that after taking family size into consideration those same female-headed units had a $526.79 net gain in median per dependent income. It would appear that the losses in female earnings are more than compensated for by the smaller families of those heads of households. It is possible, however, that the loss in earning power of the females created a need for other family members to start working, and subsequently increasing the per dependent income.

In terms of inequality, the female distributions of both earnings and of income per dependent became more unequal, by about 20%, due to development. This, however, can be taken as evidence that at least some higher income women did not experience the net losses noted on the aggregate level. For example, in 1965 16.3% of the females in the experimental region earned $5,000 or more, but by 1970 the percentage went to 8.3%, a loss of 8 points. In the control region the percentage dropped even more abruptly; from 17.6% in 1965 to 5.6% in 1970, a loss of 12 points. Thus relative to the control, the developing area had a 4 point increase in the percentage of female-headed households earning $5,000.00 or more.

It is not suprising that women in both regions are earning less than their relative share of income, yet the net effect of development seems to have been that there was a net increase in their relative share of earnings in the experimental region: in 1965 females in the developing area earned 49.7% less than would be expected and by 1970 this gap had increased to 56.9% of the expected. In the control region, however, they fared much worse: a decline from 47.4% of the expected in 1965 to 62.4% in 1970. Again, relative to the control we find that the female-headed households increased their relative share of earnings by a modest amount. This same trend holds when considering the percent relative shares of income per dependent.

As for the male-headed households, we found that they experienced net gains in both earnings (+$383.47) and in per dependent income (+$103.52), although in the latter the gains were more moderate. Likewise there have been reductions of about 10% in the level of inequality for the males.

In sum, we find evidence that in the developing area the female-headed households suffered in terms of earnings while male-headed households gained. There is evidence, however, to suggest that the females did not experience a net loss in family affluence, but this is likely due to having smaller families. Further, there is evidence that relative to the control area, the females had a small increase in their relative share of both earnings and income per dependent. It should be noted, however, that the women still are in an inferior position vis-a-vis the males in terms of aggregate income.

Table 4 contains summary data for both farm and nonfarm households, however, the information for the farm group must be suspect because of the instability (inter-annual) variation in farm income. Further, it was noted that the within-group variation is extremely large for this category, especially in 1965. For these reasons, we are hesitant to make inferences about the developmental process based on these data.

As for the nonfarm households, there is little evidence to suggest any substantial difference in median earnings in 1965, yet the median earnings of nonfarm families in the developing region is unmistakably higher in 1970. We estimated that net effect of development to be a $271.68 gain in average earnings. Furthermore, the relative position of nonfarm households has increased in the experimental region: in 1965 they received almost exactly their relative share of earnings, but by 1970 they were controlling 10.7% more earnings than they warranted on the basis of their size. The relative share of earnings accruing to nonfarm families in the control also increased, but to

a lesser degree, and by 1970 they were receiving only 2.4% more earings than expected. When, however, we take family size into consideration it is found that there is a smaller gain of $181.04, and little or no change in equity. In short, it would appear that development has had a positive effect on nonfarm families, but this impact has been stronger on earnings than on family well-being. Evidentially, the nonfarm families have sufficiently larger families to reduce the effect of development.

Table 4 also presents the descriptive statistics for heads of households 65 years old or older as well as for those under 65. As for the elderly, it appears that the net effect of development was a $245.22 loss in average earnings. While this seems small in absolute dollars, it represents a more substantial decrease in relation to the 1965 median earnings, a 12.8% decline. The elderly fair somewhat better in terms of income per dependent since they tend to have smaller families: there was a net loss of only $32.63, or 1.8% of the 1965 average, for the five year study period. Perhaps the most revealing aspect of the plight of the elderly is, however, found in the percentage of income they received. In relation to the control region, the elderly in the developing region experienced a substantial decline in the relative shares of income received, and this trend holds for per dependent income as well as earnings. On the basis of the evidence presented in Table 4, it would seem fair to conclude that development had had a negative impact on those heads of households 65 years old or older. This conclusion is consistent with Clemente and Summers' (1973) earlier, and somewhat different, analysis of these same data.

As for those heads of households under the age of 65, this group experienced a $671.90 net increase in median earnings. A more modest net gain of $209.78 was also found in income per dependent. It is interesting to note that

in the experimental region in 1970, those heads of households under 65 controlled 19.2% more of the earnings than would be expected as compared to the +10.3% for those in the control region. In short, development seems to have had significant positive effects on this group, but these effects are much more pronounced in terms of earnings than in income per dependent.

Overall, it would seem that development has had a positive, albeit small, impact on male heads of households, nonfarm households, and households headed by someone under the age of 65. Clearly there is considerable overlap among these categories. In the 1971 data, for example, 80.2% of the total male-headed households were under age 65 as compared to the 58.9% of the female-headed households under that same age.

The results of our analysis as applied to female-headed households are somewhat mixed. Although we found that they lost in average earnings, they gained in their share of total earnings. This in addition to their higher within-group inequality, suggests that development "stretched" the distribution of female earnings such that the median decreased, while a relatively few women were able to maintain, or perhaps improve, their position. The end result of this "stretching" is a net increase in aggregate earnings controlled by female-headed households as a group. When considering income per dependent, however, the picture is somewhat less confused: in comparison to the control region, the females in the experimental area gained in equity as well as in average per dependent income. This is likely due to these households having smaller families as well as possible additional non-earnings income.

As for the elderly, our analysis is relatively clearcut. It would seem that development had adverse affects on both earnings and income per dependent, although the latter was very small. In addition, they suffered a decline in the share of aggregate income (of either type) they controlled.

Importance of Migration. Thusfar, we have described changes in the distribution of income for all families, and for various subgroups, within each region. Such comparisons, however, do not shed light on the processes which may have caused the differences noted in the preceding section. It has been observed by several investigators that the increased demand for labor in developing areas tends to attract workers from outside the region (see Summers, et al., 1975 for a detailed discussion). Many of the newly created jobs are captured by these newcomers, and in this sense represent a gain for the "community" but may also represent a loss for the longer-term residents of the developing region.

In the 1971 survey, an annual residential history was obtained from each respondent. On the basis of this information, the samples were partitioned into those who have been living continuously in each area since 1965 -- the "residents" -- and those who migrated into the areas since 1965 -- the "immigrants". Using this criterion, it was found that 20.4% of the heads of households in the control region migrated into that region since 1965 while in the experimental region the percentage of immigrants was 21.0%. There is no statistically significant difference between these two rates at the .05 level.

Although there is little regional variation in the rate of in-migration, this does not mean that there are not important differences in the social composition of these immigrants. Table 5 presents descriptive statistics on selected social characteristics for the residents and immigrants in each region. The striking feature of these data is the comparability among the residents of each region: the respondents who have been living in the experimental area since 1965 are vitually indistinguishable from their control region counterparts. As for the immigrants to both regions they are younger, better educated, hold higher status jobs, and have larger families than the longer-term residents.

Table 5

Social Characteristics of 1971 Heads of Households
By Length of Residence

Characteristic	Experimental Region		Control Region	
	Residents[1]	Immigrants[2]	Residents[1]	Immigrants[2]
% Female-Headed Households	25.1 (n=912)	6.4 (n=251)	24.7 (n=320)	15.9 (n=82)
Mean Family Size	2.0 (n=913)	2.5 (n=251)	1.9 (n=320)	2.5 (n=82)
Mean Years of Education	10.9 (n=906)	12.4 (n=248)	10.7 (n=320)	11.7 (n=82)
Mean Status of Current Job	36.3 (n=661)	44.2 (n=212)	32.7 (n=237)	38.6 (n=69)
Mean Age	53.6 (n=912)	36.9 (n=251)	53.8 (n=320)	44.6 (n=82)

[1]Respondents who have been living in the region continuously since 1965

[2]Respondents who migrated into the region since 1965

More importantly, the immigrants into the developing region are considerably younger, have higher educational levels, and occupy higher status occupations than do the immigrants to the control.

The contrast between the residents and immigrants is especially dramatic in the case of the experimental area. The respondents who migrated into this region are, on the average, 16.7 years younger and have received 1.5 additional years of education. It can only be concluded that in-migration has had a potentially important social impact on the social composition of the people living in the developing region. To the degree, for example, that higher education represents an investment which can be converted into job opportunities, the immigrants are in a more favorable competitive position than the residents,

and given their younger age it is anticipated that this advantage will continue into the future.

Table 6 tabulates the descriptive characteristics of earnings and income per person in 1970 by the length of residence in each region. We can assess

Table 6

1970 Income Characteristics by Length of Residence
(In 1965 Dollar Units)

Type of Income	Experimental Region		Control Region		Net Effect of In-migration in Experimental Region
	Residents[1]	Immigrants[2]	Residents[1]	Immigrants[2]	
Earnings					
Median	$5,013.58	$6,234.55	$4,441.95	$5,526.30	$ 113.69
Standard Deviation of Log Income	0.904	0.753	0.938	0.834	-0.002
% Relative Share	-3.4%	+12.2%	+1.1%	-4.3%	
N	840	240	311	82	
Per Dependent Income					
Median	$2,052.50	$2,213.23	$2,016.12	$1,958.33	$ 53.17
Standard Deviation of Log Income	0.836	0.792	0.824	0.881	-0.021
% Relative Share	+0.9%	-3.2%	+1.5%	-5.8%	
N	913	251	320	82	

[1]Respondents who have been living in the region continuously since 1965

[2]Respondents who migrated into the region since 1965

the impact of immigration by assuming that if there had been no in-migration in either region, the 1971 cross-section statistics would be similar to those of the residents alone. Given this assumption, we can compute the net effect of immigration into the experimental region as:

$$\text{Net Effect} = (I_e - I_e^r) - (I_c - I_c^r)$$

where I is the median income from the 1970 cross-sectional survey (Table 3)

and I^r is the median 1970 income computed for the residents alone (Table 6). The "e" and "c" subscripts indicate the statistics for the experimental and control regions respectively.

As can be seen from Table 6, the levels of earnings are higher for the immigrants in both regions. Similarly the amounts of inequality in earnings are less for the immigrants. There is, however, an important regional difference in earnings equity: the immigrants to the developing area control 12.2% more of the earnings than would be expected on the basis of their numbers whereas the immigrants to the control received 4.3% less than expected.

When it comes to income per dependent, however, we note that the higher earnings of the immigrants tend to be mitigated by their larger family sizes, hence the resident-newcomer differential is much less apparent. In fact, when family size is controlled, the immigrants in both regions are receiving less of the income per dependent than we would expect on the basis of their numbers in the samples.

Using the procedure described above we found that the estimated effect of immigration in the experimental area is a $113.89 gain in earnings, or about 14.5% of the total net gain observed in Table 3. The net effect of immigration on per dependent income is less, only $53.17, but this represents 25.1% of the total gain in income per dependent. It would appear, then, that immigration into the developing region had a rather small impact in terms of absolute dollars, yet when expressed as a ratio to the total effect of development even these small changes seem more significant.

Conclusions

Of the many unanswered questions which surround rural industrial development, we believe that the issue of who benefits and who pays is one of the most impor-

tant. There are a large number of studies which show that the "average" income tends to increase in developing regions, yet one must be rather careful when interpreting such statistics. Primarily, changes in aggregate income do not reflect the whole nature of the distribution of these incomes. It is not clear, for example, whether these changes are the result of changes in the resident population or are due to alterations of the composition of the community through in-migration. Further, even if the question of migration could be avoided, considering only changes in "average" income may hide any inequalities and inequities in its distribution within the community.

Our data do not suggest that development had a dramatic effect on the level of income, either in terms of earnings of head or standardized family income, of families in the region undergoing development. There is evidence, however, to suggest that development tended to increase the homogeneity (equality) of income.

When the data are partitioned by sex, occupation, and age it was found that development had its most substantial effect on the elderly. Those 65 years old or older were in a more inferior position after development than before.

As for the status of women, the situation is more complicated. We did find evidence that development adversely affected the average earnings of female heads of households, yet there is also evidence that at least a few women were able to maintain, and possibly improve, their earnings. If income per dependent is considered the criterion, we found that in comparison to the control region, the females in the developing area experienced substantial gains.

In terms of the role of immigration, it was found that there is no evidence that development created a greater rate of in-migration, yet it does seem that those who migrated were of a different social composition than the longer-term residents, viz., they were better educated, held higher status jobs, had larger

families, were younger, and had higher and more homogeneous incomes. Immigration in the developing region appears to have caused a relative increase in the median earnings of the area as well as having a reducing effect on income inequality. Perhaps more importantly, the immigrants received a greater share of the earnings than we would have expected on the basis of their numbers in our samples.

While the effect of immigration seems clear, it must be noted that the magnitudes of this effect were rather small. This may indicate that the initial impact of industrial development was to set into motion certain social dynamics which will have major long-term effects on the developing region.

NOTES

[1]See Summers, et al., (1975) for an extensive discussion of case-studies of rural industrial development.

[2]The human capital economists such as Mincer (1974) have shed much light on the nature of the reward-investment relationship.

[3]Merriam (1968) has an excellent discussion of these types of problems.

[4]See Summers, et al., (1969) for a full description of the study design and description of the study regions.

[5]There is a possible problem here. Typically in social surveys, we ask the respondent to report income for the year preceding the survey, but measure characteristics of the family unit at the time of the survey. If there has been no change in family composition between the time of the survey and the income reporting period, problems do not arise; however, any event which alters the family structure such as the death of a member, divorce, marriage, births and adoptions can drastically alter our view of the family's economic position if the measure on income is based on a time period prior to the event.

REFERENCES

Alker, Hayward R. and Bruce M. Russett.
1964 "On Measuring Inequality." Behavioral Science Vol. 9 (July): 207-218.

Anderson, W. H. Locke.
1964 "Trickling Down: The Relationship Between Economic Growth and the Extent of Poverty Among American Families." Quarterly Journal of Economics Vol. 78 (November): 511-524.

Bender, Lloyd D., Bernal L. Green, and Rex R. Campbell.
1971 "Trickle-Down and Leakage in the War on Poverty." Growth and Change Vol. 2 (October): 34-41.

Clemente, Frank and G. F. Summers.
1973 "Industrial Development and the Elderly: A Longitudinal Study." Journal of Gerontology Vol. 28 (October): 479-483.

Kuehn, John A., Lloyd D. Bender, Bernal L. Green and Herbert Hoover.
1972 "Impact of Job Development on Poverty in Four Developing Areas." Agricultural Economic Report No. 225. Washington, D.C.: U.S. Department of Agriculture, Economic Research Service.

Kuznets, Simon.
1955 "Economic Growth and Income Inequality." American Economic Review Vol. 45 (March): 1-28.

McCall, John J.
1973 Income Mobility, Racial Discrimination and Economic Growth. Lexington, Mass.: Lexington Books.

Merriam, Ida C.
1968 "Welfare and Its Measurement." Pp. 721-804 in Eleanor B. Sheldon and Wilbert E. Moore (Eds.), Indicators of Social Change. New York: Russell Sage Foundation.

Metcalf, Charles E.
1972 An Econometric Model of the Income Distribution. Chicago, Ill.: Markham Publishing Co.

Mincer, Jacob.
1974 Schooling, Experience, and Earnings. New York: National Bureau of Economic Research.

Olsen, Duane A. and John A. Kuehn.
1974 "Migrant Response to Industrialization in Four Rural Areas, 1965-70." Agricultural Economic Report No. 270. Washington, D.C.: U.S. Department of Agriculture, Economic Research Service.

Peterson, John M.
1974 "Effects of Rural Industrialization on Labor Demand and Employment." Pp. 108-118 in Larry R. Whiting (Ed.), Rural Industrialization: Problems and Potentials. Ames, Iowa, Iowa State University Press.

REFERENCES (Continued)

Summers, Gene F., et al.
1969 Before Industrialization: A Social System Base Study of a Rural Area. Urbana, Illinois: Illinois Agricultural Experiment Station, University of Illinois.

Summers, Gene F., et al.
1975 "Industrial Invasion of Nonmetropolitan America." Final Report to the Office of Economic Research, Economic Development Administration, U.S. Department of Commerce, Washington, D.C.

Tweeten, Luther.
1974 "Enhancing Economic Opportunity." Pp. 91-107 in Larry R. Whiting (Ed.), Communities Left Behind: Alternatives for Development. Ames, Iowa: Iowa State University Press.