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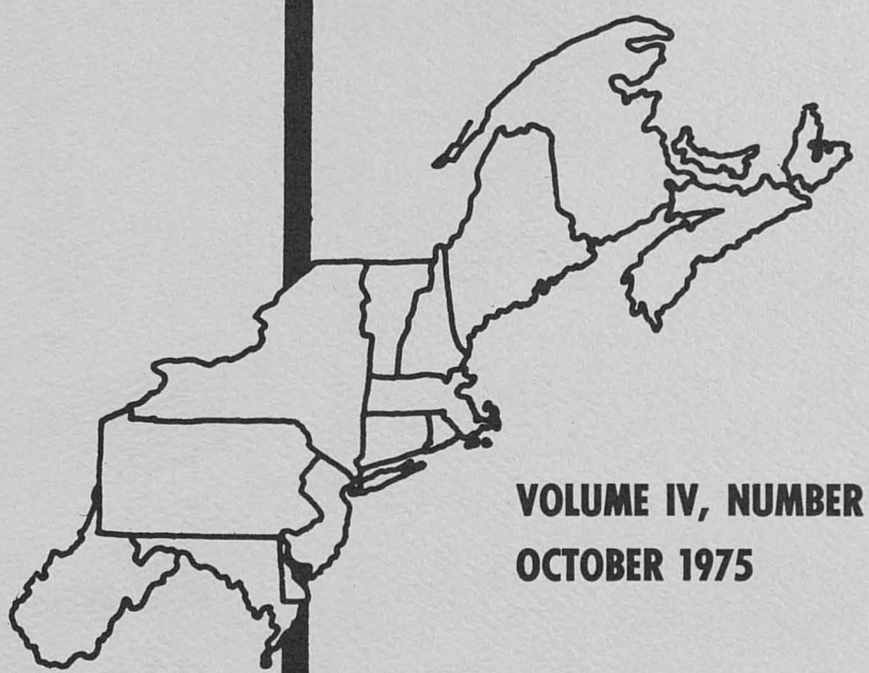

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FACTORS AFFECTING POVERTY IN THE NORTHEAST, 1960-1970*

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While many people would argue that absolute deprivation has been eliminated from this country, poverty, or relative deprivation, still exists [9]. Recognition of this problem is not new. Despite public policies to redistribute income, the public's demand for lessened personal income inequality has never been completely satisfied [7].

A primary reason for the policies' ineffectiveness lies in the definition of the problem itself. Many people throughout the country believe that poverty should be defined in relative terms, which, when carried to one extreme, leads to the continual redefinition of the problem. That is, under a relative standard of poverty the dividing line between poverty and an adequate standard of living rises in proportion to average income.

In reality, our national perspective on poverty probably lies somewhere between an absolute standard at one extreme and a completely relative standard at the other. Starting in the mid-1960's, the Social Security Administration, with the help of the Bureau of the Census and other agencies, set out to develop a poverty line based on absolute need, but one which also fluctuated with the consumer price index [6]. Based on this definition, when prices are rising slower than average incomes, the percentage rise in the poverty line is less than the percentage rise in income.1/

The 1960's marked the beginning of serious national involvement in the problems of the rural and urban poor. At the beginning of the decade, there were 21.4 percent of the families across the country in poverty. Throughout the decade many new programs were directed toward

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1/ A recent study by Kilpatrick [4] suggests that the Social Security Administration's definition reflects the public's view. He estimates the income elasticity of the poverty income line somewhere between zero and one.

the poor. By the end of the decade, this figure had declined to 10.7 percent.[2/] Although the number of families in the United States increased from 45 million to 51 million, these percentages still reflect a significant reduction in the number of families in poverty. Whether or not this reduction is due to a single or a number of poverty programs has been a topic of much debate and will not be dealt with here. Rather, the purpose of this paper is to examine those factors which seemed to be related to poverty at the beginning of the decade of the 1960's and compare them with those factors associated with poverty as the country embarked on the decade of the 1970's.

While such a comparison may seem unimportant in the midst of the current economic crisis the analysis will provide guidelines for policy development when the more pressing short-term economic problems are behind us.[3/] The relationships are established with the help of several statistical models. The parameters of the models provide "estimates of potential gains from altering explanatory variables but they do not indicate whether or not these factors can be easily altered" [8, p.39]. A comparison and discussion of the results will indicate which directions initiated during the 1960's should be continued and new directions to be explored.

The Models

While much of the previous analysis of the factors affecting the distribution of income have focused on the state or county as the unit of observation, many people argue that neither unit is particularly well suited for the analysis of many economic problems. Edwards, et al. [1] argue that multi-county areas can be more easily aligned

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2/ Throughout the paper, the 1959 poverty income line is assumed to be $3,000. For 1969, poverty incidence is calculated on the basis of the index developed by the Social Security Administration in 1964 [6], as modified by the Federal Interagency Committee in 1969. For an urban family of four headed by a male, the 1969 poverty income line was $3,745.

3/ One can argue that in the future an understanding of those factors affecting income distribution will be more rather than less important. During the 1960's momentum, some people still argued that income redistribution policies would have an adverse affect on economic growth. Since they also assumed that the benefits of growth would "trickle down" to the poor, they saw little to be gained through poverty programs. An increasing volume of empirical evidence questions this trickle down hypothesis [14], but even if one accepts the hypothesis, increased interest in income distribution questions may be warranted. Future economic prospects and a questioning of the desirability of growth will probably mean a continuing decline in the rate of growth. The question of how the nation's product is distributed takes on an added dimension in an economy that is not growing rapidly.

geographically with development problems and are more appropriate for handling development problems. Based on this argument, we direct the analysis toward the 70 multi-county regions in the Northeast developed by Edwards, et al. [1] 4/. The difference among the groups is tremendous, ranging from a group containing only Aroostook County, Maine, to one including much of the greater New York City Metropolitan Area. But the most attractive feature is that each area approximates a functional economic region.

The variables used in the regression models to explain the incidence of poverty are listed in table 1. The variables represent factors, such as education, labor market participation rates, and industrial structure, which theory suggests may have important impacts on income distribution. The rationale for including these variables will be explained in more detail in the next section. Since there are other variables which could be used to measure these same factors, incorporating the rationale along with a discussion of the results will facilitate an explanation of why these particular variables were chosen.

Three separate regression models for each of the two census years are reported in table 2. The third model specification for each year is the focal point of the discussion. They both contain some variables whose coefficients have relatively low "t" values; they were retained for comparative purposes. The other four equations are included primarily to demonstrate the stability of the model with respect to variable specification. We were able to experiment with several different industrial index and education specifications without seriously affecting the other relationships in the model. This experimentation did not improve the explanatory power of the model (i.e., increase the R^2), but it did help isolate the importance of several factors.

The Results

The variables in the models can be classified into several important categories, including education, labor participation and employment, minority influence, industrial structure. With a couple of important exceptions the impact on poverty incidence is the same in both years; the relative importance is quite different.

Labor Participation and Employment. Three of the variables (X_2, X_4 and X_5) in the models reflect directly labor participation rates and employment. High labor participation rates, as measured by the work

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4/ States included are: Maine, New Hampshire, Vermont, Massachusetts, Rhode Island, Connecticut, New York, New Jersey, Pennsylvania, Maryland, Delaware, Virginia and West Virginia.

Table 1
Variables Used in Regression Models

			Mean Value	
			1960	1970
Y	=	% of families in poverty	21.8	9.7
X_1	=	% of persons over 25 with 8 years or less of schooling	43.7	31.3
X_2	=	% of employed persons working 0-26 weeks	24.5	15.6
X_3	=	Local government expenditures per capita ($)	120.1	247.1
X_4	=	% of employed persons working 50-52 weeks a year	67.9	47.5
X_5	=	Work force as a percent of people in working age	60.2	67.9
X_6	=	% farm population	7.1	3.6
X_7	=	% nonwhite population	7.1	7.5
X_8	=	% of workers working inside the county of residence	85.1	73.6
X_9	=	Basic industrial structure index[a/]	110.5	123.1
X_{10}	=	Manufacturing structure index[a/]	93.7	97.2
X_{11}	=	Trade and professional services index[a/]	93.9	88.6
X_{12}	=	Composite industrial index[a/]	94.0	93.0
X_{13}	=	$X_1 \cdot X_7$	328.8	248.0
X_{14}	=	% rural population	48.9	44.9

Source: The data used in this analysis were obtained primarily from the Census of Population [10,11] and [12,13].

a/ Following a procedure similar to that developed by Thurow [8], these indexes are defined as

$$X_j = \sum_{i=1}^{n} E_i W_i$$

where E_i = % of area's labor force in industry i;

W_i = ratio of the area's average labor income in the industry i to the U. S. average labor income in industry i.

The composite index is developed across all employment sectors. The basic industrial index includes agriculture, forestry and fisheries and mining. The manufacturing index includes both durable and non-durable manufacturing and construction. The trade and professional services index includes the remaining industrial classification.

Table 2
Regression Equations for Poverty in the Northeast

Variables	1960 Models			1970 Models		
	1	2	3	1	2	3
X_1	0.420	0.405	0.442	0.391	0.376	0.243
	(5.692)	(5.451)	(5.396)	(5.789)	(5.358)	(3.277)
X_2	0.637	0.596	0.600	0.304	0.130	-0.011
	(7.112)	(6.130)	(6.172)	(2.275)	(0.901)	(-0.081)
X_3	-0.028	-0.023	-0.020	0.003	0.012	0.015
	(-1.928)	(-1.390)	(-1.263)	(0.681)	(1.735)	(2.356)
X_4	-0.167	-0.158	-0.166	-0.129	-0.103	-0.114
	(-3.404)	(-3.184)	(-3.313)	(-2.039)	(-1.613)	(-1.956)
X_5	-0.175	-0.188	-0.173	-0.245	-0.246	-0.280
	(-2.627)	(-2.678)	(-2.403)	(-7.422)	(-7.270)	(-8.673)
X_6	0.264	0.321	0.346			
	(2.757)	(3.174)	(3.337)			
X_7	0.158	0.140	0.417	-0.051	-0.018	-0.518
	(2.937)	(2.664)	(1.562)	(-0.143)	(0.392)	(-3.321)
X_8	-0.054	-0.061	-0.042		0.039	0.017
	(-0.946)	(-1.092)	(-0.720)		(1.003)	(0.482)
X_9		0.012	0.012		0.011	0.014
		(1.151)	(1.173)		(1.792)	(2.381)
X_{10}		0.064	0.060		-0.006	0.000
		(1.078)	(1.001)		(-0.365)	(0.010)
X_{11}		-0.154	-0.167		-0.130	-0.162
		(-1.262)	(-1.360)		(-1.658)	(-2.257)
X_{12}	-0.029			-0.011		
	(-0.392)			(-0.262)		
X_{13}			-0.006			0.015
			(-1.060)			(3.565)
X_{14}				0.054	0.052	0.042
				(3.016)	(2.886)	(2.515)
Constant Term	17.329	23.295	20.657	13.314	19.849	32.707
adj R^2	.897	.897	.897	0.775	0.787	0.823
d.f.	60	58	57	61	58	57
SE	2.888	2.884	2.881	2.281	2.212	2.018
F-statistic	67.712	55.729	51.28	30.763	24.239	27.764

Note: Numbers in parentheses are "t" statistics. The dependent variable in all equations is percent of families in poverty (Y).

force as a percent of people in the working age (X_5), are associated with low rates of poverty incidence. This dominant effect may reflect a willingness to work; it also is apt to mean that a higher proportion of the families have a secondary wage earner. This second fact, increased work force participation by women throughout the decade, is substantiated by the Census of Population estimates. Labor participation rates by females in the Northeast increased from 36.6 percent to 40.6 in the metropolitan areas and from 32.8 to 37.2 in the nonmetropolitan areas. These changes are significant when compared with the decline in male labor participation rates; they may be a primary reason why this variable contributes so much to the explanation of poverty incidence in 1970.5/

Many of the Nation's poor are either not working part of the year or are not in the labor force at all. Both of the other variables in this group (X_2 and X_4) represent an attempt to capture the influence of underemployment. Even though this specification does not take account of unemployment directly, there is a high correlation with unemployment and the effect of unemployment rates is surely reflected. Increasing the proportion of workers working full time (50 to 52 weeks a year, X_4) decreases the incidence of poverty significantly. As Thurow [8] observed some years ago the effect is magnified in times when wages are rising rapidly, as they did during the 1960's.

Race and Education. The impact of education and race are combined because of the interaction term in the third model of both years.6/

To begin, one should provide justification for using the percentage of people over 25 with 8 years of school or less as the explanatory variable rather than median years of schooling or some other measure of central tendency. First, any measure of central tendency may not reflect the number of people who, for lack of adequate schooling cannot compete for an unskilled job. Furthermore, Mincer's [5] work in the human capital area suggest that for a symmetric or a positively skewed education distribution function, the distribution of earnings is also positively skewed. While the area in the lower tail of the education distribution function is not a true measure of skewness, it is probably more highly correlated with skewness than is any single measure of central tendency.

5/ See table 3 for the beta-coefficients [3] of the regression models, indicating the importance of a single regressor in explaining the predicted value of the dependent variable.

6/ Some people might object to the consideration of these models because of the rather low "t" values associated with the coefficients on X_{13} for 1960. The equations were included because the author felt there is a logical and interesting interpretation to be made. However, without exception, the other conclusions in the paper can be derived from equations 2.

Table 3
Beta-Coefficients for Regression Equations

Independent Variables	1960-Model 3		1970-Model 3	
	B*	Rank	B*	Rank
X_1	0.390	2	0.371	4
X_2	0.370	3	0.006	11
X_3	-0.097	9	0.246	6
X_4	-0.169	6	-0.117	9
X_5	-0.124	8	-0.509	3
X_6	0.219	5	-	
X_7	0.420	1	-0.953	2
X_8	-0.038	12	0.039	10
X_9	0.068	10	0.160	8
X_{10}	0.062	11	0.000	12
X_{11}	-0.145	7	-0.276	5
X_{12}	-		-	
X_{13}	-0.292	4	1.010	1
X_{14}	-		0.179	7

Note: According to Goldberger [3] the Beta-Coefficient (B*) is given by $B^* = (\text{regression coefficient}) \left[\frac{\text{standard deviation, independent variable}}{\text{standard deviation, dependent variable}}\right]$.

Because of the interaction terms, isolating the impact of education and race, requires some algebra. For 1960,

$$\frac{\partial Y}{\partial X_1} = 0.442 - 0.006X_7.$$

Whether or not a reducation in the number of people with no more than an eighth grade education reduces poverty incidence depends on the size of the nonwhite population (X_7). At the mean level of X_7, a one percent reduction in persons with low education levels gives rise to a 0.3999 percent reduction in poverty incidence. The impact of the nonwhite population on poverty incidence is given by

$$\frac{\partial Y}{\partial X_7} = 0.417 - 0.006X_1.$$

Evaluating this expression at the mean value of X_1, the model suggests that in 1960 a one percent decrease in the nonwhite population would result in a 0.155 percent decrease in poverty incidence. As the schooling level improves (X_1 falls), the effect of large minority populations is diminished slightly.

For 1970, the picture is quite similar for changes in education at the margin. From model 3,

$$\frac{\partial Y}{\partial X_1} = 0.243 + 0.015X_7,$$

indicating a one percent reduction in the number of persons with low incomes leads to a 0.356 percent reduction in poverty incidence (for X_7 evaluated at the mean). The interaction term does not reinforce the direct effect as it does for 1960, but initial levels of nonwhite populations are low enough that this probably presents little difficulty.

Because the coefficient on the interaction effect is positive, it plays an extremely important role in determining the impact of the size of the nonwhite population. From model 3,

$$\frac{\partial Y}{\partial X_7} = -0.518 + 0.015X_1.$$

Looking strictly at the direct effect, one would not expect this inverse relationship between poverty incidence and nonwhite population. Evaluating the expression at the mean level of X_1, however, generates a coefficient which is still negative, but close to zero (-0.049).

The implications of the 1960-1970 comparisons are significant. In the 1960 equations the percentage of nonwhite population was

extremely important in explaining poverty incidence, both along and as part of the interaction with the education variable. Both relationships underscore the handicap of being nonwhite and of being poorly educated and unable to be an effective participant in the labor force.

By the end of the decade, educational improvements appeared able to overcome some of the disadvantages of being nonwhite. The percent of nonwhites 25 years of age or older in the United States with an eighth grade education or less, fell from 59.8 to 42.4 percent, as compared with a fall from 39.7 to 28.3 percent for the white population. Education, coupled with improved job opportunities brought about primarily by the Civil Rights movement, probably helps explain the change in the model's coefficients. While one can certainly not interpret these results as an indication that the problems of minority groups have been eliminated, they do provide some support for the belief that some progress is being made toward providing minorities access to better income opportunities.

Industrial Indices. The initial attempts to capture the impact of industrial and employment structure are represented by models 1 in table 2. The coefficients on the composite index, X_{12}, had the expected sign, but as a result of the low "t" ratios, little confidence could be placed in the results. A much better indication of the impact of employment structure on poverty incidence is provided in equations 2 or 3, where three separate indices, one for the extractive industries (X_9), one for the manufacturing (X_{10}) and one for services (X_{11}) are delineated.

At the beginning, as well as the end of the decade, the predominance of an extractive industry in an area was an indication that the poverty incidence was high. The relative importance, as measured by the ranking of the beta-coefficients in table 3, is about the same; the size of the coefficients themselves in both years are identical. Employment in the extractive industries fell by 30.8 percent over the decade. Many of the people in rural areas throughout the Northeast that were employed, or underemployed in low wage extractive industries found better alternatives elsewhere. For those people left in these industries, the future may not be as bleak as it was ten years ago. Still one would not seriously recommend expansion in these sectors as a solution to the poverty problems in the Northeast.

Employment in service industries for both metropolitan and nonmetropolitan areas in the Northeast increased by 32.8 percent from 1960 to 1970. In both years, the regression coefficients are large negative numbers, indicating that an increase in this index (X_{11}) is associated with a substantial decrease in the incidence of poverty. The relationship is strong enough that when incorporated into a composite index (as in the first models for 1960 and 1970) it more than compensated for the effect of manufacturing and the extractive industries. The net result from using the composite index was to mask the most interesting relationships.

In both models, the impact of the manufacturing index is rather weak, in an absolute as well as a relative sense. The interesting fact is that the direction of the effect is different. For 1960, an increase in the manufacturing index is associated with an increase in the percentage of families in poverty; for 1970 an increase in the index is related to a slight decrease in poverty incidence. The explanation lies in the changing structure of manufacturing employment. In 1960, there was a much higher concentration of employment in apparel, textile and food and kindred products industries. Since these are traditionally low-wage industries, the fact that high manufacturing employment was associated with high rates of poverty incidence is not surprising.

For a host of reasons, including wage differentials, lack of factory space and shifts in product markets, all but two states in the Northeast, Maine and Delaware, lost an average of 32.6 percent in their food and kindred products employment from 1960 to 1970. States except Maryland, Virginia and West Virginia lost an average of 23.0 percent of their textile and apparel employment. As these industries moved out, they were replaced by a higher wage, durable manufacturing. Machinery manufacturing employment rose in all of the 13 states by an average of 51.1 percent over the decade. Primary and fabricated metal employment was up in some states and down in others. In all but New York, New Jersey, Maryland and Maine employment in vehicles and transportation equipment manufacturing was up by 52.0 percent.

Rural-Urban Influence. The rural-urban influence was perhaps the most difficult to isolate of all the relationships studied. In part, the problem stems from the delineation of the multi-county regions. While there is certainly a number of predominantly rural regions represented, all groups contained at least one small urban center.7/ However, if one can argue that farm and other rural residents are influenced substantially be a nearby urban center, regardless of its size, the relatively minor (when compared to 1960) relationship between poverty incidence and rural orientation in the 1970 model may be perfectly reasonable.

In fact, the difference between the size of the coefficients on the rural orientation variable (X_6 in the 1960 and X_{14} in the 1970 model) may be nothing more than a reflection of the repopulation of some rural areas across the country, a trend that is presently gaining momentum. During the 1960's the Northeast was the only region in the country that maintained moderately high rates of growth in most rural counties.

7/ In 1970, 25 of the 70 multi-county areas in the sample contained no SMSA's.

Summary and Conclusions

Models such as the ones discussed in this paper are not complete structural models of poverty incidence since the direction of causality does not run exclusively from independent variables to the dependent variable [8]. The term "poverty cycle" is quite appropriate since lack of education, unemployment and discrimination leads to poverty which in turn perpetrates low education levels and unemployment, etc. The models do identify systematically the symptoms of poverty in the Northeast at the beginning and end of the decade of the 1960's. By interpreting the two models in light of the changes that have occurred during the 1960's, some insight is gained into where policy should be focused.

The most significant conclusions seem to involve education, employment structure and a rural orientation. Despite the decline in total manufacturing employment throughout the Northeast in the 1960's, the increase in manufacturing employment in the high wage, durable manufacturing industries has improved the employment structure. Policies to accelerate these changes may be difficult to identify and must involve long-run planning. Increased utilization of the existing labor force and further reductions in underemployment are also likely to be effective.

Perhaps the most important conclusions involve the interaction between the nonwhite population and education. Some evidence supports the hypothesis that the sheer handicap of being a member of a minority group is less now than in 1960. The evidence by no means suggests that the problem has been eliminated, but it does indicate that we have made some progress. Combining education and employment opportunities for minority groups should become an increasingly effective policy for the reduction of poverty.

Finally, the most encouraging changes seem to be with respect to the rural orientation. Movement back to the rural areas of the Northeast began during the 1960's and helps explain why the rural areas in the Northeast have faired better than those in other regions of the country. Policies to facilitate the dispersion of population and industry, particularly in the Northeast, can be designed to capitalize on the existing momentum.

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