INCOME AND POVERTY ACROSS SMSAs:

A TWO-STAGE ANALYSIS

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INTRODUCTION

Among the many explanations of income and poverty levels, especially among black families, two have garnered much of the recent public and academic attention: welfare disincentives and urban deindustrialization. Although on the surface, these explanations appear quite dissimilar, they do have a common thread.

The "welfare-disincentive" explanation argues that while public assistance raises family income and reduces poverty directly, it has the opposite effects indirectly. According to this argument, welfare leads recipients to reduce their work, schooling and traditional family formation [Murray, 1984] all of whose reductions significantly affect family income and poverty adversely. Blacks are hurt more than whites because a larger percentage of blacks have only the low-wage labor market options for which public assistance is a substitute.

The "urban-deindustrialization" argument concentrates instead on the disappearance of manufacturing jobs from urban areas. The resulting deprivation and absence of meaningful work gives rise to an "underclass" [Wilson and Neckerman, 1986; Wilson, 1987]. And underclass attitudes, by discouraging work, schooling and traditional family formation, further adversely affect family income and poverty. Blacks are hurt more than whites because blacks are less mobile and are subject to greater discrimination in alternative, non-manufacturing employment.

Expressed this way, the common thread is clear. Each sees some environmental influence giving rise to an underclass, thus discouraging work, schooling and traditional family formation. And each sees these underclass characteristics as adversely affecting family income and poverty. The difference is over the environmental influence most responsible for creating this underclass — welfare disincentives or urban deindustrialization.

This paper explores these arguments further. First, we develop a two-stage model to predict a city's median family income and poverty rate. The model allows the city's welfare level and industrial structure, among other things, to affect its median family income and poverty rate directly. It also allows them to affect income and poverty indirectly, through their effects on underclass creation. We estimate the model, separately for blacks and whites, using cross-sectional, Standard Metropolitan Statistical Area (SMSA)-level data. Finally, we simulate the total effects, direct and indirect, of changes in welfare and industrial structure on SMSA median family incomes and poverty rates.

Eastern Economic Journal, Vol. 19, No. 1, Winter 1993

THE MODEL

Our model divides the determinants of a city's median family income and poverty rate into two sets. The first, exogenous from the perspective of the family, includes (1) level of public assistance, (2) (change in) industrial structure, (3) overall economic growth, (4) racial makeup, and (5) region. The second, endogenous under either the welfare-disincentive or urban-deindustrialization accounts, includes (1) employment, (2) education, and (3) family structure. The model is recursive. The variables in the second set are functions of those in the first, and median family income and poverty rate are functions of both.

Within the context of this model, both welfare-disincentive and urban-deindustrialization proponents would agree that the endogenous variables — employment, education and family structure — are important determinants of median family income and poverty rate. And both would agree that, with the development of an underclass, these measures worsen. However, they would disagree as to the impact of particular exogenous variables on the development of this underclass. Proponents of the welfare-disincentive argument would stress public assistance, which they see reducing the incentive for employment, education and the formation of traditional families. Proponents of the urban-deindustrialization argument would stress the decline of central-city manufacturing, which they see reducing opportunity and thus the incentive for employment, education and the formation of traditional families.

The welfare-disincentive argument has been the subject of considerable research. Welfare-disincentive effects are plausible on both theoretical and empirical grounds. Danziger et al. [1981] report a wide range of estimates for the effect of public assistance on employment, concluding that such aid does appear to have a negative effect. In addition, Danziger et al. [1982] and Hess [1990] find that public assistance has a moderate, but statistically significant effect on the incidence of female-headed families. And Ellwood and Bane [1985] find that the level of Aid to Families with Dependent Children (AFDC) support has particularly strong effects on living arrangements; young single mothers are much less likely to live with their parents in high benefit states.[1]

The urban-deindustrialization argument actually can be interpreted in two ways. First, blacks might be hurt by low *levels* of manufacturing. This might be true if manufacturing is less discriminatory than other sectors. Possible reasons are that manufacturing is more capital intensive and impersonal in its production than other, more service-oriented industries [Franklin, 1968, 370], that large manufacturing firms tend to have more formal personnel policies [Masters, 1975, 85], and that manufacturing firms are often organized by industrial unions which are less discriminatory than their craft union counterparts [Ashenfelter, 1972, 435]. Whatever the reason, though, this interpretation suggests no particular difference between cities that have lost much of their manufacturing and cities that never had much.

Second, blacks might be hurt by *declines* in manufacturing. This might be true if blacks are less mobile than whites. Sociologist Kasarda writes of the "*confinement* of poorly educated blacks in cities *rapidly losing jobs* that do not require ... a high school education" [1985, 35, emphasis added]. Economists Kain [1968] and Ihlanfeldt and Sjoquist [1990] argue that the movement of manufacturing from central cities has created a "spatial mismatch" between unskilled black workers and the jobs for which they are qualified. According to this interpretation, cities that have lost much of their manufacturing should suffer in the employment, education and family structure of local blacks, compared to cities that never had much manufacturing. We consider both interpretations.

Overall economic growth, racial makeup and region are control variables. Certainly, no one should be surprised if economic growth matters. Including an explicit measure is important to help ensure that measures of manufacturing actually reflect industrial mix, rather than act as proxies for the overall state of the economy.

Something should be said about racial mix as well. Becker [1971] shows that, assuming discriminatory tastes by employers, the black/white wage ratio decreases as the supply of black labor increases. And on a more empirical level, Wilson [1987] cites work by Stanley Lieberson to the effect that racial discrimination against early *Asian* immigrants was also virulent in the places where these immigrants were concentrated. However, restrictions on immigration kept their numbers small, and they were able to find "occupational niches in small, relatively stable communities." By contrast, blacks came to the cities in large numbers. Their numbers made them seem more of a threat to whites, and made it more difficult for them to find such "niches" [Wilson, 1987, 33]. All this suggests not only that racial mix matters, but also that it might have a non-linear, or threshold, effect as the minority group grows relative to the majority.

Our main concern, though, is with the effect of public assistance and manufacturing, controlling for these other variables. According to the welfare-dependency argument, cities with higher public assistance should show lower employment, education and traditional family formation — and thus worse median family income and poverty rate — these other things held equal. According to the urban-deindustrialization argument, cities with lower (or reduced) levels of manufacturing should show these effects.

THE DATA

We use 1980 Census data for SMSAs, along with 1970 data to create the change variables [U. S. Bureau of the Census, 1973; 1983]. Cities not large enough to have been SMSAs in 1970 are excluded,[2] as are SMSAs with fewer than 3,000 black residents, or with more than 20 percent of the black or white population enrolled in college.[3] Honolulu is also excluded, where the majority population is neither white nor black.[4] 195 cases remain.

The advantage of this data base is that it provides a great deal of SMSA-specific data, including data on local labor market conditions and the socio-economic characteristics of the population, allowing us to explore the relationships suggested in the model discussed above. The data reveal that the SMSAs differ dramatically in their real public assistance, their size and growth (or decline) of their manufacturing sectors, and the extent to which they have developed large underclasses. Unfortunately, the SMSA data may be geographically too broad, covering such things as the movement of manufacturing firms from the central city to the suburbs within an SMSA, which could be important to the urban-deindustrialization thesis.[5]

To account for differences in cost of living, we deflate nominal values using the American Chamber of Commerce Researchers Association (ACCRA) inter-city cost of living index for the second and third quarters of 1979. Unfortunately, the index is not computed for all the cities in our sample. We estimate the unavailable indexes by applying the coefficients from an equation regressing city size and regional variables against the ACCRA index for existing cases to the characteristics of the cities lacking indexes.[6] Although this procedure is clearly inferior to having actual measures of the cost of living in every SMSA, we feel that it is far superior to using nominal values and ignoring the substantial cost-of-living differences among cities.

Table 1 defines our variables and presents their means and standard deviations. Endogenous variables are measured separately for blacks and whites. Those we consider exogenous are not. Since our unit of analysis is the metropolitan area, the statistics should be interpreted with some care. These statistics are computed from SMSA-level data; small SMSAs receive the same weight as large ones.[7]

Two dependent variables measure different aspects of the distribution of family income within SMSAs. Real median family income, ($\$FAMINC_i$), defined both to be pre-tax and to include transfer payments, approximates the income performance of a typical family. The percent of families below the poverty line, ($\%FAMPOV_i$), measures the lower-end of the income distribution. We assume that median family income and poverty rate are determined by the same set of independent variables.[8]

Employment, education and family structure are represented in our data by the labor force participation rate ($\%LFP_i$), the unemployment rate ($\%UN_i$), the percentage of adults who are high school graduates ($\%HSGRAD_i$) and the percentage of female-headed households ($\%FHEAD_i$). These are the endogenous explanatory variables. While independent variables in the $\$FAMINC_i$ and $\%FAMPOV_i$ equations, they, themselves, depend on the remaining exogenous variables.

Three of the exogenous variables are central to this study — the level of public assistance ($\$AID_i$), and two measures of manufacturing ($\%MANU70_i$ and $\Delta\%MANU_i$). $\$AID_i$ includes Supplemental Security Income (SSI), AFDC and general assistance. $\%MANU70_i$ measures the percentage of the SMSA's 1970 employment that was in the manufacturing sector. We use $\%MANU70_i$ to represent the *level* of manufacturing, and $\Delta\%MANU_i$ represents its *change*. Our choice of the 1970 instead of the 1980 level of manufacturing is somewhat arbitrary; their effects, given a particular change between 1970 and 1980, must be the same. By using $\%MANU70_i$, though, we can interpret the coefficient for $\Delta\%MANU_i$ more naturally as the effect of a change, given a particular *starting* level.

Finally, several additional exogenous variables are included as controls. The level of government employment ($\%GOVT_i$) controls for an aspect of the industrial structure other than manufacturing. $\%\Delta EMP_i$ controls for overall economic growth. $\%BW_i$ and $\%BW_i^2$ control for racial mix. And dummy variables $WEST_i$ and $SOUTH_i$ control for region.

Expressing the model in terms of the available measures gives the following set of equations to be estimated:

$$(1)\quad \begin{bmatrix} \$FAMINC_i \\ \%FAMPOV_i \end{bmatrix} = \alpha_0 + \alpha_1\%LFP_i + \alpha_2\%UN_i + \alpha_3\%HSGRAD_i + \alpha_4\%FHEAD_i + \alpha_5\$AID_i + \alpha_6\%MANU70_i + \alpha_7\Delta\%MANU_i + \alpha_8\%GOVT_i + \alpha_9\%\Delta EMP_i + \alpha_{10}\%BW_i + \alpha_{11}\%BW_i^2 + \alpha_{12}WEST_i + \alpha_{13}SOUTH_i + e_i$$

$$(2)\quad \begin{bmatrix} \%LFP_i \\ \%UN_i \\ \%HSGRAD_i \\ \%FHEADi \end{bmatrix} = \beta_0 + \beta_1\$AID_i + \beta_2\%MANU70_i + \beta_3\Delta\%MANU_i + \beta_4\%GOVT_i + \beta_5\%\Delta EMP_i + \beta_6\%BW_i + \beta_7\%BW_i^2 + \beta_8 WEST_i + \beta_9 SOUTH_i + e_i.$$

TABLE 1
Variable Definitions and Descriptive Statistics[a]

Variable	Mean	Std Dev	Definition
\$FAMINC-B[b]	\$13,164	\$2,098	Real median black family income (\$)
\$FAMINC-W[b]	\$21,147	\$2,263	Real median white family income (\$)
%FAMPOV-B	24.68%	2.57%	Black families below poverty line (%)
%FAMPOV-W	6.30%	1.92%	White families below poverty line (%)
%LFP-B	61.54%	6.20%	Black labor force participation rate (%)
%LFP-W	63.37%	3.96%	White labor force participation rate (%)
%UN-B	12.28%	4.36%	Black unemployment rate (%)
%UN-W	5.63%	1.98%	White unemployment rate (%)
%HSGRAD-B	54.85%	9.68%	Black (25 and over) HS graduation rate (%)
%HSGRAD-W	69.92%	6.65%	White (25 and over) HS graduation rate (%)
%FHEAD-B	36.27%	5.97%	Black families headed by females (%)
%FHEAD-W	11.09%	1.53%	White families headed by females (%)
\$AID[b]	\$2,351	\$351	Real mean public assistance payments to families on public assistance (\$)
%MANU70	25.38%	10.94%	Manufacturing employment/total in 1970 (%)
Δ%MANU[c]	-2.49%	3.33%	Change in manufacturing employment/total since 1970 (%)
%GOVT	17.35%	5.56%	Government employment/total (%)
%ΔEMP[c]	40.39%	29.40%	Change in total employment since 1970 (%)
%BW	16.10%	15.32%	Black/White population ratio (%)
$\%BW^2$	$492.77\%^2$	$2897.90\%^2$	Black/White population ratio squared ($\%^2$)
WEST	.18	.39	Dummy variable (1 = west; 0 = other)
SOUTH	.36	.48	Dummy variable (1 = south; 0 = other)

[a]Except as noted, all statistics are from SMSA census data for 1980; $N = 195$.
[b]Dollar measures are deflated as described in the body of the paper.
[c]$\Delta\%MANU = (\%MANU80\text{-}\%MANU70)$; $\%\Delta EMP = ((EMP80\text{-}EMP70)/EMP70)100$.

The first two equations estimate the direct effects of all endogenous and exogenous variables on the median family income and poverty rate. The second four estimate the effects of the exogenous variables on the four endogenous ones (the labor force participation rate, the unemployment rate, the percent of adults who are high school graduates, and the percentage of female-headed households). All six equations are estimated separately for blacks and whites. They are estimated first using ordinary least squares (OLS). The results are then tested for heteroscedasticity using White's test, and those that test positive are reestimated with weighted least squares (WLS), again using the procedure proposed by White.[9] In the results that follow, the estimating procedure, OLS or WLS, is indicated for each equation.

THE RESULTS

Median Family Income and Poverty Rate

Table 2 presents the results for the median family income and poverty rate regressions, for both whites and blacks. Among the endogenous variables, all coefficients have the expected signs, and all are highly significant. Of course, these results are consistent with both welfare-disincentive and urban-deindustrialization arguments.

It is interesting to note, though, how some of the black and white coefficients differ. Measured in terms of their effects on median family income, the rewards for high school graduation and labor-force participation are much greater for whites than for blacks, as are the penalties for female-headed families and unemployment. Measured in terms of their effects on the poverty rate, the rewards for high school graduation and labor-force participation are somewhat smaller for whites than for blacks, as are the penalties for female-headed families. Only the effect of unemployment on poverty rate seems the same for both races.

In interpreting these differences, and others to follow, it is worth remembering that median family income is much further above the poverty line for whites than for blacks. Hence, it would be only natural for whites, at *their* median family income, to act less like poverty families than blacks, at *theirs*. It is not clear how much this difference in medians accounts for the pattern described above, but it probably accounts for some.

Among the exogenous variables, $\$AID_i$ generally has the intended effect of increasing median family income and decreasing the poverty rate. However, the effect on black poverty rate is not significant. Also, the size of the effect on white median family income is surprising. One might have predicted a minimal effect here, since white median family income is above the level at which anyone should be receiving assistance. Instead, an additional \$1 of $\$AID_i$ is associated with an additional \$1.90 of income. We may have reverse causation here. Higher income communities may be more generous in their aid. The welfare-disincentive argument, of course, predicts negative consequences from aid — something that we do not see. However, so far we have just the direct effect, holding constant the endogenous variables above. Until we examine the effects of $\$AID_i$ on the endogenous variables themselves, we do not have a real test of the argument.

The percentage of employment in manufacturing ($\%MANU70_i$) also has most of the expected effects. Higher $\%MANU70_i$ is associated with higher median family income for blacks and lower poverty rates for both races. Only median family income for whites is unaffected, reflecting the fact that workers in this higher income range are likely to be better educated and have better alternatives to jobs in manufacturing. This is all in line

TABLE 2
Median Family Income and Poverty Rate[a]

	\$FAMINC-B	\$FAMINC-W	%FAMPOV-B	%FAMPOV-W
%LFP[b]	90.43067	207.90629	-0.11699	-0.07564
	(8.35)	(11.40)	(2.56)	(5.01)
%UN[b]	-52.82504	-170.33981	0.36716	0.36329
	(2.46)	(3.41)	(5.62)	(16.69)
%HSGRAD[b]	58.95020	132.77876	-0.18186	-0.11518
	(6.61)	(10.90)	(4.46)	(15.39)
%FHEAD[b]	-161.27011	-432.83504	0.39674	0.34956
	(11.51)	(7.92)	(7.64)	(14.10)
\$AID	0.91890	1.89554	-0.00122	-0.00058
	(3.88)	(7.73)	(1.39)	(3.43)
%MANU70	59.16644	-3.11628	-0.07472	-0.04236
	(6.85)	(0.33)	(1.99)	(6.69)
Δ%MANU	5.55946	-105.80109	0.11389	0.06414
	(0.31)	(3.61)	(1.08)	(3.24)
%GOVT	0.65356	-55.36912	-0.00016	0.04547
	(0.06)	(3.22)	(0.00)	(5.90)
%ΔEMP	3.79687	-4.55984	-0.01830	-0.00045
	(1.59)	(1.58)	(1.76)	(0.20)
%BW	48.18137	85.26269	-0.14122	-0.06250
	(4.75)	(5.75)	(2.75)	(7.08)
$\%BW^2$	-0.60083	-1.05241	0.00237	0.00057
	(3.96)	(4.27)	(2.96)	(5.04)
WEST	-1693.94986	-1196.59717	2.12915	0.46822
	(5.91)	(5.79)	(2.32)	(2.93)
SOUTH	-1729.20347	-187.01959	4.42452	1.52773
	(8.43)	(0.60)	(4.54)	(7.67)
CONSTANT	7583.01635	338.82466	27.84834	15.09765
R^2	0.55320	0.64942	0.69805	0.72192
R^2 (adj)	0.52111	0.62424	0.67636	0.70195
df	181	181	181	181
	wls	wls	ols	wls

[a]The numbers in parentheses are absolute t statistics.
[b]These variables are race specific. The black measures are used in the equations for blacks; the white measures in the equations for whites.

with the first version of the urban-deindustrialization argument — that it is the *level* of manufacturing that matters. Again, though, we are still holding constant the endogenous variables above. Thus, we do not yet have a real test of the argument.

Of course, the change in the percentage of employment in manufacturing ($\Delta\%MANU_i$) is included to test the second version of the urban-deindustrialization argument — that it is the *change* in manufacturing that matters. The results here are not particularly supportive. $\Delta\%MANU_i$ shows insignificant effects on black median family income and poverty rate and adverse effects on whites. With regard to income, it is true that a reduction in manufacturing would help whites, thereby increasing the white-black differential. But this is hardly the usual story of the underclass. Furthermore, the black poverty rate coefficient, while insignificant, is actually larger than the significant white one. The results suggest that a reduction in manufacturing would reduce the poverty rate for blacks almost twice as much as for whites. Again, we are holding constant the endogenous variables. Thus, we do not yet have a real test of the argument. But these results make the *change* interpretation less promising than the one above.

Although the foregoing variables are key to evaluating the welfare-disincentive and urban-deindustrialization arguments, the remaining control variables require some comment. $\%GOVT_i$, indicating the percentage of workers in another major sector, shows no effect on black median family income and poverty rate, and adverse effects on whites. Apparently for blacks, government and private-sector service jobs are roughly comparable, while for whites the private-sector service jobs are better. $\%\Delta EMP_i$ controls for economic growth. Perhaps the surprise is how little growth matters, controlling for industrial structure. Even using one-tailed tests, assuming that growth raises income and reduces poverty, only one coefficient (for black poverty rate) is significant at the .05 level.

Finally, the effect of the black/white ratio is significant and non-linear. At low levels, an increase in the black/white ratio raises median family income for both blacks and whites, with whites benefiting more. As the black/white ratio increases, though, the size of these benefits decreases, hitting zero for both races at about 40 percent. For the 10 percent of the cases above 40 percent, an increase in the black/white ratio reduces median family income for both, with whites losing more. At low levels, an increase in the black/white ratio also reduces the poverty rate for both blacks and whites, this time with blacks benefiting more. Again, as the ratio increases, the size of this benefit decreases, but this time, much more rapidly for blacks. Above 30 percent, increases in the black/white ratio raise the black poverty rate; the same does not happen for whites until about 50 percent.

We included the non-linear measure for racial makeup in the expectation that crowding would be bad for blacks, and indeed, black/white ratios above 40 percent both lower black median family income and raise the black poverty rate. Perhaps more important, though, is the similarity in the results for the two races. In particular, blacks seem to benefit from increases in the black/white ratio up to approximately 30 percent. And so do whites.

The Endogenous Variables

The previous results establish that the endogenous variables have highly significant effects on median family income and poverty rate. We turn now to the question of what affects *them*. According to the welfare-disincentive argument, $\$AID_i$ should have significant adverse effects on the endogenous variables; according to the urban-deindustrialization argument, $\%MANU70_i$ and/or $\Delta\%MANU_i$ should have significant beneficial ones. Table 3 presents the results.

The effect of $\$AID_i$ on $\%FHEAD_i$ is positive and significant for both races. $\$AID_i$ appears to raise $\%FHEAD_i$, thus indirectly decreasing median family income and increasing the poverty rate. This result supports the welfare-disincentive argument. On the other hand, the effect on the high school graduation rate of whites — which would have been significant using a one-tailed test — has the wrong sign. And the effects on the other variables are insignificant.

$\%MANU70_i$ fares worse. While it has significant effects on $\%UN_i$ and the high school graduation rate of whites, the signs are wrong. There is no support here for the first version of the urban-deindustrialization argument — that *low levels* of manufacturing contribute to the underclass. Lower $\%MANU70_i$ is actually associated with lower unemployment and a higher graduation rate.

$\Delta\%MANU_i$, on the other hand, does quite well. It has significant effects on $\%LFP_i$ for both races. Its effects on $\%UN_i$ and $\%FHEAD_i$ are significant for whites. Its effects on $\%HSGRAD_i$ and $\%FHEAD_i$ approach significance for blacks as well. And all coefficients have the expected signs. Thus, these results do support the second version of the urban-deindustrialization argument — that *declines* in manufacturing contribute to the underclass. Recall that $\Delta\%MANU_i$ fared poorly in the median family income and poverty rate equations. These new results suggest that it has its important effects through its effects on the endogenous variables.

We point out, in passing, that $\Delta\%MANU_i$ is not just a proxy for growth. $\%\Delta EMP_i$ also strongly affects the endogenous variables, with the expected signs. Both the growth in the number of jobs and the change in their composition have important effects.

Combining the Results

We have found that $\$AID_i$, $\%MANU70_i$ and $\Delta\%MANU_i$ all have significant direct effects on median family income and/or the poverty rate. However, we have also found that these same variables have potentially strengthening or offsetting indirect effects, through their effects on the endogenous variables. For example, $\$AID_i$ directly increases median family income. However, $\$AID_i$ also increases $\%FHEAD_i$, which decreases median family income. The size of this indirect effect through $\%FHEAD_i$ is just the coefficient for $\$AID_i$ in the $\%FHEAD_i$ equation times the coefficient for $\%FHEAD_i$ in the equation for median family income. Table 4 combines all such effects, presenting, in three subtables, the combined direct and indirect effects of (1) an additional \$100 in $\$AID_i$, (2) an additional 1 percentage point in $\%MANU70_i$, and (3) an additional 1 percentage point in $\Delta\%MANU_i$.

For example, the direct effect of an extra \$100 in $\$AID_i$ on black median family income (\$91.88971) is just \$100 times the $\$AID_i$ coefficient in the $\$FAMINC_i$ equation (0.91890 in Table 2).[10] The indirect effect through $\%LFP_i$ (-\$2.09383) is the product of \$100, the coefficient of $\$AID$ in the $\%LFP_i$ equation (-0.00023 in Table 3), and the coefficient of $\%LFP_i$ in the $\$FAMINC_i$ equation (90.43067 in Table 2). All the other indirect effects are figured the same way. The total effects are the sums of the direct and indirect ones.

TABLE 3
The Endogenous Variables[a]

	%LFP-B	%LFP-W	%UN-B	%UN-W	%HSGRAD-B	%HSGRAD-W	%FHEAD-B	%FHEAD-W
$AID	-0.00023 (0.15)	0.00041 (0.61)	-0.00029 (0.36)	0.00013 (0.29)	-0.00013 (0.07)	0.00242 (1.80)	0.00387 (2.88)	0.00127 (3.27)
%MANU70	-0.01401 (0.21)	-0.05196 (1.46)	0.19153 (6.93)	0.04201 (2.18)	-0.04566 (0.57)	-0.28522 (5.00)	-0.04245 (0.74)	-0.01805 (1.09)
Δ%MANU	0.64676 (3.48)	0.34376 (5.19)	-0.01658 (0.18)	-0.19344 (3.57)	0.34885 (1.55)	0.07668 (0.48)	-0.19558 (1.22)	-0.09035 (1.94)
%GOVT	-0.08624 (0.94)	-0.05269 (1.10)	0.09606 (2.48)	0.06614 (2.47)	0.28346 (2.54)	0.00089 (0.01)	-0.12222 (1.54)	0.05596 (2.44)
%ΔEMP	0.05252 (2.89)	0.03996 (6.31)	-0.01914 (2.44)	-0.01145 (2.17)	0.01096 (0.50)	0.07502 (4.80)	-0.02730 (1.74)	-0.01004 (2.21)
%BW	0.09318 (1.03)	0.06385 (1.40)	0.05722 (1.25)	-0.03354 (1.27)	-0.16651 (1.52)	0.09563 (1.22)	0.21430 (2.73)	-0.01127 (0.50)
$\%BW^2$	-0.00230 (1.62)	0.00008 (0.11)	-0.00013 (0.20)	0.00022 (0.52)	0.00012 (0.07)	0.00013 (0.10)	-0.00253 (2.06)	-0.00013 (0.36)
WEST	-0.55926 (0.37)	-1.88565 (2.38)	1.35647 (2.02)	1.19575 (2.72)	8.24107 (4.51)	-0.06107 (0.05)	-6.34856 (4.88)	0.49656 (1.32)
SOUTH	-2.81853 (1.73)	-3.41765 (5.27)	-3.03005 (4.10)	-0.14257 (0.30)	-7.07882 (3.58)	-8.74370 (6.23)	-2.76541 (1.97)	0.19151 (0.47)
CONSTANT	64.19250	64.52254	7.40373	3.35587	55.51315	70.20658	30.96035	7.84940
R^2	0.25618	0.21784	0.37067	0.38424	0.55303	0.52103	0.40427	0.24398
R^2 (adj)	0.22000	0.17979	0.34006	0.35429	0.53129	0.49773	0.37529	0.20720
df	185 ols	185 wls	185 wls	185 ols	185 ols	185 ols	185 ols	185 ols

[a]The numbers in parentheses are absolute t statistics.

TABLE 4
The Combined Effects[a]

(a) An additional $100 in $AID

	$FAMINC-B	$FAMINC-W	%FAMPOV-B	%FAMPOV-W
Direct	91.88971 (3.88)	189.55396 (7.73)	-0.12175 (1.38)	-0.05826 (3.43)
Indirect				
%LFP[b]	-2.09383 (0.15)	8.43715 (0.60)	0.00271 (0.14)	-0.00307 (0.59)
%UN[b]	1.51830 (0.32)	-2.23631 (0.28)	-0.01055 (0.35)	0.00477 (0.29)
%HSGRAD[b]	-0.78752 (0.07)	32.12574 (1.77)	0.00243 (0.07)	-0.02787 (1.79)
%FHEAD[b]	-62.38497 (2.80)	-55.01030 (2.98)	0.15347 (2.68)	0.04443 (3.17)
Total	28.14169 (0.76)	172.87024 (4.41)	0.02631 (0.23)	-0.04000 (1.26)

(b) An additional 1% in %MANU70

	$FAMINC-B	$FAMINC-W	%FAMPOV-B	%FAMPOV-W
Direct	59.16644 (6.85)	-3.11628 (0.33)	-0.07472 (1.99)	-0.04236 (6.69)
Indirect				
%LFP[b]	-1.26691 (0.21)	-10.80224 (1.44)	0.00164 (0.20)	0.00393 (1.38)
%UN[b]	-10.11781 (2.32)	-7.15614 (1.79)	0.07032 (4.32)	0.01526 (2.16)
%HSGRAD[b]	-2.69185 (0.56)	-37.87073 (4.50)	0.00830 (0.55)	0.03285 (4.75)
%FHEAD[b]	6.84559 (0.74)	7.81383 (1.07)	-0.01684 (0.73)	-0.00631 (1.09)
Total	51.93546 (3.38)	-51.13156 (3.01)	-0.01129 (0.23)	0.00337 (0.25)

TABLE 4 (Cont.)
The Combined Effects

(c) An additional 1% in Δ%MANU

	$FAMINC-B	$FAMINC-W	%FAMPOV-B	%FAMPOV-W
Direct	5.55946	-105.80109	0.11389	0.06414
	(0.31)	(3.61)	(1.08)	(3.24)
Indirect				
%LFP[b]	58.48671	71.47065	-0.07566	-0.02600
	(3.19)	(4.71)	(2.00)	(3.56)
%UN[b]	0.87567	32.95072	-0.00609	-0.07028
	(0.16)	(2.42)	(0.17)	(3.49)
%HSGRAD[b]	20.56494	10.18151	-0.06344	-0.00883
	(1.49)	(0.48)	(1.43)	(0.48)
%FHEAD[b]	31.54107	39.10499	-0.07759	-0.03158
	(1.21)	(1.88)	(1.19)	(1.92)
Total	117.02784	47.90678	-0.10890	-0.07256
	(2.94)	(1.02)	(0.78)	(1.91)

[a]The numbers in parentheses are absolute t statistics. They are calculated from the results of the simulations described in the body of the paper.
[b]These variables are race specific. The black measures are used in the equations for blacks; the white measures in the equations for whites.

We attempt to judge the significance of the indirect and total effects with a simulation. Each coefficient used in calculating the indirect and total effects in Table 4 is assumed to be a normal random variable with mean and standard deviation equal to the estimate and its standard error. We then sample each 10,000 times, calculating 10,000 values for each of the indirect and total effects. From these, we calculate standard deviations for each of the indirect and total effects. These standard deviations, which can be thought of as empirical standard errors for the indirect and total effects, are used to calculate the *t* statistics reported in the table.[11]

Consider first the results for *$AID*$_i$ (Table 4a). The welfare-disincentive argument predicts that the beneficial direct effects of public assistance will be offset by harmful indirect effects. One of the indirect effects — the effect through *%FHEAD*$_i$ — is as predicted. For blacks, an increase of $100 in *$AID*$_i$ directly increases median family income by $91.89; yet since it also increases *%FHEAD*$_i$, it also indirectly *reduces* median family income by $62.38. This same increase of $100 in *$AID*$_i$ directly reduces the poverty rate by 0.12 percentage point; yet since it also increases *%FHEAD*$_i$, it also indirectly *increases* the poverty rate by 0.15 percentage point. These results are consistent with the literature cited earlier in our discussion of the model. It should be noted that none of the other indirect effects, through employment and education, are as predicted. Still, the total effect of *$AID*$_i$ is reduced to insignificance. There is some support here for the welfare-disincentive argument.

For whites, the results are similar. Again, an increase in *$AID*$_i$ increases *%FHEAD*$_i$, indirectly reducing median family income and increasing poverty. Again, none of the other indirect effects are as predicted; indeed, this time there is the hint of a beneficial indirect effect through *%HSGRAD*$_i$. However, the big difference in the results for whites is that, because of the very large direct effect, the total effect of *$AID*$_i$ on median family income remains strongly positive. We are reluctant to conclude that an increase in *$AID*$_i$ actually would have such a positive effect on white incomes, though. As suggested earlier, we suspect the causation runs the other way.

Among the several possible explanations for the preceding results, the following seems most plausible. More prosperous SMSAs, as measured by the median family income of whites, offer somewhat more generous levels of public assistance (*$AID*$_i$). Although these higher levels of public assistance have favorable direct effects on poverty rates, the indirect effects through family structure (*%FHEAD*$_i$) offset the gains. In the end, poverty rates are not affected. And neither is the median family income level of blacks.

Consider next the results for *%MANU70*$_i$ (Table 4b). The first version of the urban-deindustrialization argument predicts that the beneficial direct effects of higher *levels* of manufacturing will be reinforced by beneficial indirect effects. However, none of the indirect effects are as predicted. For blacks, only one of the indirect effects — the effect through *%UN*$_i$ — is significant, and it has the wrong sign. A 1 percentage point increase in *%MANU70*$_i$ directly increases median family income by $59.17; yet since it also increases *%UN*$_i$, it also indirectly *reduces* median family income by $10.12. The same increase of 1 percentage point in *%MANU70*$_i$ directly reduces the poverty rate by 0.07 pecentage point; yet since it also increases *%UN*$_i$, it also indirectly *increases* the poverty rate by 0.07 percentage point. The total effect on median family income remains positive; the total effect on the poverty rate is reduced to insignificance.

For whites, the details differ. Most importantly, a 1 percentage point increase in *%MANU70*$_i$ does not directly increase median family income at all. And in this case, two of the indirect effects — the effects through *%UN*$_i$ and *%HSGRAD*$_i$ — are significant. Again, though, they have the wrong signs. An increase in *%MANU70*$_i$ increases *%UN*$_i$ and reduces *%HSGRAD*$_i$, indirectly reducing median family income and increasing the poverty rate. The total effect on median family income is negative; the total effect on the poverty rate is again reduced to insignificance. The urban-deindustrialization argument receives no real support here.

One aspect of these results — the tremendous difference in the effect of *%MANU70*$_i$ on blacks and whites — deserves comment before preceding. A 1 percentage point increase in *%MANU70*$_i$ increases black median family income by $51.94, while reducing white family income by $51.13. Previous research has shown that black-white median family income differentials depend directly on the level of manufacturing [Seeborg, 1990]. Our results agree. Moreover, our results suggest two reasons. First, there is the direct effect on black median family income. Perhaps manufacturing really is less discriminatory. And second, there is the indirect effect on white median family income. In particular, with an increase in manufacturing, white education declines, and thus so does white income.

Finally, consider the results for $\Delta\%MANU_i$ (Table 4c). The second version of the urban-deindustrialization argument predicts that it is the *change* in manufacturing that will have the beneficial indirect effects. And this time, we find some support. All indirect and total effects have the predicted signs, and using the appropriate one-tailed test, about one half of them are significant. For blacks, the direct effects are insignificant. Moreover, just one of the indirect effects — the effect through $\%LFP_i$ — is significant at the usual levels. Still, the effects through $\%HSGRAD_i$ and $\%FHEAD_i$ seem too large to ignore completely. An increase of 1 percentage point in $\Delta\%MANU_i$, largely through its beneficial effects on $\%LFP_i$, $\%HSGRAD_i$ and $\%FHEAD_i$, increases median family income by (a significant) \$117.08, while reducing the poverty rate by (an insignificant) 0.11 percentage point.

For whites, the direct effects are actually harmful. However, three of the indirect effects — the effects through $\%LFP_i$, $\%UN_i$ and $\%FHEAD_i$ — are significant. An increase of 1 percentage point in $\Delta\%MANU_i$, through its beneficial effects on $\%LFP_i$, $\%UN_i$ and $\%FHEAD_i$, increases median family income by (an insignificant) \$47.91, while reducing the poverty rate by (a significant) 0.07 percentage point.

CONCLUSIONS

The results above shed some light on the plausibility of two explanations of the underclass: the welfare-dependency argument popularized by Charles Murray [1984] and the urban-deindustrialization argument popularized by William Julius Wilson [1987]. By either account, some environmental influence gives rise to an underclass, thus discouraging work, schooling and traditional family formation. And by either account, these underclass characteristics have adverse effects on family income and poverty. The difference is over the environmental influence most responsible for creating this underclass — welfare disincentives or urban deindustrialization.

Our results give limited support for both arguments. We have shown, for example, that the real level of public assistance in a metropolitan area has an effect on the proportion of families that are female-headed. This is consistent with the welfare-disincentive argument. But we were unable to show that the level of public assistance has any effect on employment, another popular argument.

The urban-industrialization argument also receives some support. Though lower *levels* of manufacturing disadvantage blacks relative to whites, the indirect effects are not consistent with the usual story of the underclass. However, *declines* in manufacturing show a broad pattern of harmful effects on employment, education and family structure.

The indirect effects of declines in manufacturing, while broad, are not uniformly significant. One possible reason is that the unit of observation is the entire metropolitan area. We undoubtedly miss some of the relevant change in manufacturing — the movement of manufacturing firms from the central city to the suburbs within the metropolitan area. Estimating indirect effects in more narrowly defined geographical areas would be a fruitful area for future work.

Still, our results show cases in which indirect effects strengthen the direct effects, and cases in which they completely offset them. Thus, in the evaluation of the effects of metropolitan structural characteristics on family income and poverty, it is clearly important to take indirect effects into account.

NOTES

We would like to thank Mark Israel for his outstanding research assistance. In addition, we are grateful to the editors and an anonymous referee for their helpful comments.

1. We acknowledge two limitations of our model as it relates to the welfare-disincentive argument. First, we have not included migration explicitly. To the extent that public assistance induces migration, we would expect even stronger effects of aid on work, education and family structure. Unfortunately, we cannot separate the effects on current residents from the effects due to migration. Second, we have included no reverse causation. It is possible that areas with higher incomes, or with more female-headed families, might choose to be more generous in their aid. However, aid levels are not determined primarily at the local level. Hence, we have not tried to include such reverse causation in our model.
2. Between 1970 and 1980, there were changes in definition for a few of the larger SMSAs (including New York). For these, we use county data to estimate what the 1970 numbers would have been under the 1980 definitions.
3. Seven small SMSAs with large universities — places like Madison, Wisconsin and Champaign, Illinois — were eliminated on the grounds that more than 20 percent of the black or white population was enrolled in college. College students are, of course, high school graduates. However their incomes are quite low and not at all representative of high school graduates in the labor force. Thus, including SMSAs with very large percentages of college students would bias downward the estimated effect of education on income.
4. In all other SMSAs, whites constitute the majority. In all others, whites and blacks together constitute at least 75 percent of the total population; 98 percent is more typical. In Honolulu, by contrast, whites and blacks are both minorities, together making up just 37 percent of the total population.
5. We experimented with the census data on "urbanized areas" in hopes of addressing this problem. In general, the results were similar to those reported below. But, in fact, those data did not address the problem anyway. Some of the urbanized areas are actually larger than the largest SMSAs.
6. Before excluding cases for all of the reasons above, we had 106 SMSAs that were covered by the ACCRA 1979 cost of living study. In the third quarter [ACCRA, September 1979], 98 were reported, and another 8 were reported a quarter earlier [ACCRA, June 1979]. Running an OLS regression on these 106 cases gave the following results:

$$INDEX = 105.6^{a} + .00002^{a}POP - 1.03\,R1 - 10.43^{a}R3 + 8.29^{a}R4 - 5.40^{a}R5 - 10.00^{a}R6 - 9.76^{a}R7$$

Adjusted R Square = .43; [a] indicates significance at the .01 level.

where *INDEX* is the ACCRA cost of living index, *POP* is the 1980 population, and *R1* through *R7* are dummy variables indicating Census Region. (*R1* = Pacific, *R2* = Mountain, *R3* = West North Central, *R4* = West South Central, *R5* = East North Central, *R6* = East South Central, *R7* = South Atlantic).

This equation, then, was used to estimate the cost of living index for the SMSAs not included in the ACCRA surveys. Our final data set of 195 SMSAs includes 97 of the 106 SMSAs for which we have an actual index, and 98 for which we have just this estimate.

7. In the regressions to follow, we do test for heteroscedasticity and correct for it where we find it. However the unit of analysis is still the SMSA, not the individual, and New York City is still just one observation.
8. Previous empirical work supports this assumption [Ellwood and Summers, 1986, 81].
9. The primary source is White [1980]. For an accessible account, see Ramanathan [1980, 455-66].
10. Using \$100 rather than \$1 just makes the scale more meaningful. Further, any discrepancy is due to rounding. This and the following calculations are made using the unrounded values, rather than the rounded values reported in Tables 2 and 3.
11. @RISK, a LOTUS add-in, used for the simulation, is limited in its specification among random variables. Thus, we end up treating all coefficients as independent, even though the coefficients in the same equation are not. This problem should not affect our results for the indirect effects, however, since these are products of coefficients from different equations. It could affect our results for the total effects, but we think the distortion is likely to be small.

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