NBER WORKING PAPERS SERIES

INDUSTRIAL SHIFTS, SKILLS LEVELS, AND THE LABOR MARKET FOR WHITE AND BLACK MALES

John Bound

Harry J. Holzer

Working Paper No. 3715

NATIONAL BUREAU OF ECONOMIC RESEARCH
1050 Massachusetts Avenue
Cambridge, MA 02138
May 1991

We would like to thank Charles Brown, Sheldon Danziger, Dan Hamermesh, and seminar participants at Georgia State, Michigan, and Michigan State for their comments. Marshall Cummings and Steve Hughes provided valuable computational assistance. Financial support from Michigan State University and the Presidential Initiatives Fund at the University of Michigan is gratefully acknowledged. This paper is part of NBER's research program in Labor Studies. Any opinions expressed are those of the authors and not those of the National Bureau of Economic Research.

NBER Working Paper #3715
May 1991

INDUSTRIAL SHIFTS, SKILLS LEVELS, AND THE LABOR MARKET FOR WHITE AND BLACK MALES

ABSTRACT

In this paper we estimate the effects of industrial shifts in the 1970s and 1980s on the wages and employment of black and white males. We use micro Census data for 52 MSAs, and estimate effects separately by age and education group. The results show that industrial shifts did reduce demand for blacks and less-skilled males in 1970s and 1980s. Demand shifts away from manufacturing, in particular, reduced employment and wages for black and white males. While the magnitudes of these effects are fairly small for many groups, they can account for one-third to one-half of the employment decline for less-educated young blacks in the 1970s. These results imply fairly large effects on the earnings of less-skilled males in the 1980s as well.

John Bound
Population Studies Center
University of Michigan
1225 South University
Ann Arbor, MI 48104
and
NBER

Harry J. Holzer
Department of Economics
Michigan State University
East Lansing, MI 48823

I. Introduction

During the past two decades, employment rates for less-educated men in general and for less-educated black men in particular have dropped substantially. Perhaps the most popular explanation for this drop involves the notion of a growing "mismatch" between the skills of the less-educated and the changing skill requirements of jobs. In the academic literature, this view has been most forcefully argued by William Wilson.[1] In a series of papers, Kasarda has also argued that the industrial transformation of US metropolitan areas has meant a sharp decline in the demand for black, less-educated labor, resulting in rising unemployment for them.[2]

While it is clear that the industrial shifts that have occurred over the last two decades represent shifts in the structure of demand away from less skilled towards more skilled labor (e.g., Katz and Murphy (1991), Bound and Johnson (1989)), it is less clear to what extent these shifts can explain the employment declines that have occurred, especially among blacks. At the same time that demand for less skilled labor was dropping, educational attainment was rising for both blacks and whites. At least a priori, it seems possible

---

[1]Wilson (1987) also emphasizes the notion of "spatial mismatch", where inner-city blacks are disadvantaged as firms (particularly manufacturing) relocate to the suburbs. Insofar as most of the analysis in this paper is done at the level of the entire metropolitan area, spatial mismatch effects will not be considered here. For a review of the literature on these effects see Holzer (1991).

[2]Kasarda (1989) has shown that unemployment among black male high school dropouts is highest in MSA's where manufacturing has declined or left the inner-city. But these results are based only on cross-tabulations for a small sample os MSA's, with no analysis of causal relationships and no controls. Among others, Hughes (1989) and Massey and Eggers (1990) consider effects of manufacturing on various measures of poverty and/or segregation within metropolitan areas.

that these supply shifts could have offset the demand shifts, thereby negating any deleterious effects on the less-educated.

Moreover, declines in industries that have typically employed less-educated labor will have effects on the employment and/or wages of such labor only to the extent that displaced workers have trouble finding jobs in other industries. The impact of the demand shifts will thus depend on the extent to which employers in the growing sectors are willing to hire less-educated workers, and/or the wages they offer. If the new wage offers are lower than those paid in the declining sectors, they might result in lower employment (due to high relative reservation wages) as well as lower wages.[3]

In this paper we provide estimates of the effects of recent industrial shifts on the wages and employment of white and black men.[4] We use micro data from the 1970 and 1980 Census of Population to construct measures of changes in labor demand for white and black males based on industrial structure, especially focusing on changes in manufacturing. We then use these measures to explain changes in wages and employment for white and black males of various age and education levels.

The analysis is cross-sectional, and covers 52 metropolitan areas with large populations of blacks. While the econometric estimation is done only for the period 1970-1980, we also use summary data on manufacturing shifts

---

[3]See Krueger and Summers (1986) for evidence on industry wage premia that persist over time, and especially for the positive effect of manufacturing, when controlling for personal characteristics such as education. Relative wages for blacks in manufacturing have also been higher in manufacturing than in other industries.

[4]We focus on males only, since trends in the female labor market are generally confounded by other factors (such as growing female labor force participation), and since less-skilled males have generally been much more dependent on declining industries such as manufacturing for their employment. We also omit non-black Hispanics and other ethnic categories here.

during the 1980's to predict effects on annual earnings of males for this later period.

This study differs from earlier ones that focus on demand shifts and inequality in a variety of ways. By focusing on differences across MSA's, we can exploit the enormous variation in employment outcomes and in industrial structures that exist across geographic areas. We also focus on black and white males, and in ways which differ from other papers that have done so.[5] For instance, the very large sample sizes of the decennial Censuses enable us to disaggregate by both age and education as well as by region within these groups. The experiences of young and less-educated black males of the declining industrial centers of the Northeast and North-Central regions can thus be analyzed specifically here. We separately consider employment and wage outcomes, since these show divergent trends for blacks (relative to whites) over much of the last two decades.

The next section discusses the data and estimated equations in greater detail. The results of the empirical work are then presented in Section III, while a conclusion appears in Section IV.

The results of the analysis can be briefly summarized here. They show that industrial shifts did reduce demand for blacks and less-skilled males in

---

[5]Recent papers by Cain and Finnie (1989) and Freeman (1989) analyze demand effects and black-white differences across MSA's without considering industrial structure Juhn et.al. (1989) also do not consider industry explicitly. In contrast, the recent papers by Blackburn et.al., Bound and Johnson, and Katz and Murphy (as well as Freeman (1982)) analyze industrial shifts but do not distinguish between effects on blacks and whites. Of those which do both, there are unpublished papers by Acs and Danziger (1990) and Bound and Freeman (1990) which focus primarily on annual earnings with micro data (rather than MSA's). Only Johnson and Oliver (1991) parallel our approach of analyzing blacks and whites across MSA's and focusing on manufacturing changes, though they focus on a broader range of structural changes and use quite different estimation techniques from ours.

the 1970's and 1980's. The decline in manufacturing has reduced both wage levels and employment for black and white males. While the magnitudes of these effects are fairly small for many demographic groups, they can account for one-third to one-half of the employment decline experienced by educated young blacks in the 1970's. Large effects of manufacturing declines on the earnings of less-skilled males in the 1980's are also implied by the data.

II. Data and Estimated Equations

To test for the effects of industrial shifts on the wages and employment of various groups, we have analyzed data from the Public Use Micro Samples (PUMS) of the 1970 and 1980 Census of Population. We focus on a sample of MSAs which had at least 25,000 blacks in residence in 1970 and which appear in both the county-group data files of the 1970 PUMS and the A Sample of the 1980 PUMS Files. There are fifty-two such MSA's, and they are listed in the Appendix below. As of 1970, they contained 57% of whites and 77% of blacks living in metropolitan areas in the U.S.[6]

Since the boundaries of MSA's frequently change over time, it was important to maintain consistency in the definitions used for these geographical units. We do so by aggregating county-level data into the appropriate MSA's, based on the 1970 definitions of these areas.

As noted above, a "mismatch" is said to exist when labor demand has shifted between sectors of the economy and labor supply is slow to adjust - whether because of lack of skills, locational differences, high reservation wages of workers, etc. Any attempt to measure the extent to which industrial

[6]The 1970 data are based on a 2% sample of the U.S. population and the 1980 data are based on a 5% sample. As of 1970, 68% of all whites and 74% of all blacks lived in metropolitan areas.

shifts have created mismatches for particular groups of workers in an MSA should therefore use measures of demand shifts for them based on their industrial employment there as well as their supply adjustments.[7]

For each MSA, we have constructed fixed-weight measures of changes in demand based on industrial structure which take the following form:

$$1) \qquad D_{ijk} = \alpha_{ijk}\dot{E}_{jk}; \quad D_{ik} = \sum_j D_{ijk}$$

where i represents a particular demographic group, j represents the industry, and k represents the metropolitan area. The α's represent the share of the ith group's employment in the kth SMSA in 1970 that is accounted for by the jth industry; thus $\sum_j \alpha_{ijk}=1$. The $\dot{E}_{jk}$ represent the percent growth in the share of overall male employment accounted for by the jth industry in the kth MSA during the period 1970-80.[8]

The D_{ijk} are thus industry growth rates weighted by the ith group's presence in the industry, and the D_{ik} are indices that constitute weighted averages of industrial growth in each MSA. Larger values of these variables for the ith group indicate that overall demand and employment are shifting

---

[7]An alternate approach used by Lilien (1982) and Abraham and Katz (1986), uses variances in employment growth across industries as measures of sectoral shift. These papers analyze the effects of sectoral shifts on aggregate unemployment. Holzer (1988) also uses this approach across local labor markets. We prefer to focus on specific industries and how they affect particular demographic groups who may be concentrated in those industries, rather than the more aggregative approaches used in these other papers.

[8]Female employment is omitted from the overall employment growth numbers since female employment was generally rising during the 1970's but at differential rates across industries and metropolitan areas. In order to avoid confounding male-female substitutions with industry shift effects, we omit female employment effects entirely. (See Borjas (1986) for an analysis of these effects across metropolitan areas.) For similar reasons, we omit enrolled males as well, and focus only on the civilian, noninstitutional population of white and black males aged 16-64.

towards industries where that group is heavily represented, while smaller or negative values indicate the opposite.

In constructing these variables, we use 18 industry groupings which are primarily at the 1-digit level. The focus here is thus on shifts between fairly large industry groups and abstracts from any "mismatch" that might be caused by within-industry changes in the composition of employment, such as occupational upgrading.[9] The analysis thus assumes "fixed coefficients" across industries. We also note that, by using shares of overall employment in each industry, the indices are normalized for overall employment growth in the MSA between 1970 and 1980. This enables us to avoid confounding overall metropolitan growth with shifts in its industrial structure.[10]

Finally, we note the different groups for whom α_{ijk} are measured and for when the D_{ijk} have been calculated. We consider four education groups: 1) high-school dropouts; 2) high school graduates with no college; 3) those with some college, and 4) college graduates and above. Separate demand shift variables for these groups will indicate the extent to which industrial shifts have disproportionally helped or hurt workers of various skill levels, and the extent to which skills "mismatch" may have resulted from these shifts. We also compute these variables for all white and black males separately (though not for race-by-education groups, due to sample size constraints). In subsequent regressions we will use D_{ijk} measures based on both race and education.

---

[9]For evidence on occupational upgrading within industries and its effect on the demand for skilled labor see Bound and Johnson (1989) or Murphy and Katz (1991).

[10]Correlations across MSA's in employment growth between industries generally are above .9. Thus, all industries grow in growing metropolitan areas, and normalizing is critical in order to isolate shifts between industries.

These variables are computed for all age groups together (also due to sample size constraints). However, some estimated equations below will use outcome measures for groups stratified by age as well as by race and education (since recent industrial shifts may have their largest effects on the youngest cohorts in the market). We will thus be able to see how a common set of demand shifts cause differential outcomes across age groups. The ages used will be 16-24, 25-34, and 35-54.[11]

As for the estimated equations themselves, they generally take the following form:

$$2) \qquad \dot{EP}_{ik}, \dot{W}_{ik} = a + bD_{ijk} + cS_{ik} + dX_k + e_{ijk}$$

where $\dot{EP}_{ik}$ and $\dot{W}_{ik}$ represent percentage change in employment-to-population ratios and weekly wages for the ith group in the kth MSA; S_{ik} represents supply changes for the relevant group; and X_k represents other control variables that are described below.[12]

These equations are reduced-form wage and employment change equations based on labor supply and demand shifts for specific groups. Since no lagged adjustments are considered here, the wage and employment effects measured here may represent mostly short-run responses to shifts; but the ten-year length of

---

[11]We focus on 16-24 year olds as the youngest group in the labor force who might be affected by industrial shifts. But since many members of this age group remain out of the labor force due to school enrollment, we also focus on 25-34 year olds as the youngest group within the prime age (i.e., 25-54) cohort. We omit males who are 55 and older entirely, since retirement behavior begins to confound the analysis for this group.

[12]We use changes in employment-to-population ratios rather than unemployment as the dependent variables to avoid the effects of labor force participation changes, which may be fairly arbitrary among younger and middle-age males (see Clark and Summers, 1979). Employment rate changes are also more consistent with the labor market framework described here.

the period considered mitigates this concern somewhat.[13] If the labor market is generally in equilibrium, the coefficients on demand shifts in employment equations will rise with labor supply and fall with labor demand elasticities for various industries.[14] If labor market equilibrium is not achieved (due to wage rigidities), larger employment adjustments and small wage adjustments than is otherwise the case should occur.

Previous work using fixed-weight demand indices has been primarily time series in nature (e.g., Katz and Murphy, 1991). In this context it seems quite plausible that changes in industry shares come primarily from changes in product demand and differential technical change across industries that are largely exogenous to the labor market. Thus productivity increases in agriculture and manufacturing (together with demand elasticities for agricultural and manufacturing goods of less than one) are a large part of what has been responsible for the re-allocation of employment out of agriculture and manufacturing.

On the other hand, it is not at all clear that in the cross-sectional context we can treat all changes in industry employment as exogenous. For example, the move out of private domestic service among black workers presumably does not reflect a drop in demand for the services of domestic workers, but rather the opening up of alternative opportunities for these

---

[13]While "mismatch" is often thought of as reflecting short-run equilibria, its persistence will be related to the exact cause of the lack of supply adjustment as well as adjustment costs. Thus, high reservation wages, if caused by alternatives to market work, may cause a good deal of persistence; and even skill or geographic adjustments may require decades and thus only appear for new cohorts.

[14]Standard labor market models (e.g., Freeman, 1977) show that coefficients on demand shifts will be $\epsilon/\epsilon+\eta$ and $1/\epsilon+\eta$ in employment and wage equations respectively, where ϵ and η reflect labor supply and demand elasticities.

workers. In contrast, shifts in manufacturing employment presumably reflect changes in national or international product markets or technology, both of which are exogenous to local labor markets.

We will therefore use the D_{ijk} specifically for manufacturing rather than the D_{ik} as our demand shift measures in equation (2). The D_{ik} do, however, provide useful summary information on these shifts that are considered below. Furthermore, the coefficients on each D_{ijk} term must be interpreted as the effect of the overall change in industry structure that occurs along with the given change in industry j (which here will be manufacturing).

The supply variables used here are percentage changes in population shares accounted for by the ith group in the kth MSA.[15] Given changes over time in educational attainment and age mix in the labor force (the latter of which is due to factors such as the Baby Boom/Bust), it is important to control for relative changes in the supplies of groups when considering effects of demand shifts.[15] For instance, a shift of demand away from less-educated labor in a particular MSA will only lead to "skill mismatch" insofar as the magnitude of this shift is greater than the decline in supplies of such labor from falling dropout rates, rising college enrollments, regional migration, etc. We also note that demand shift variables should have positive

---

[15]The base used for calculating population shares in each case is the population of white and black males aged 16-54 in each MSA.

[16]We use own-group supply changes only in each equation. This, of course, abstracts from substitution between groups in the labor force. In alternative specifications not reported here, we also used broader measures of supply shift, such as overall education cohort sizes instead of those for whites and blacks separately. Our estimates showed stronger effects for race-specific measures, suggesting low substitutability across groups. But coefficients on the demand shifts were generally not sensitive to exactly which supply variable was used.

effects on EP and W while supply shift variables should have negative effects in both of these reduced-form equations.

We note that the X_k must include variables which control for overall demand changes, since we are interested only in the structure of demand here. This would be particularly true if employment rates for the period 1970-80 reflect cyclical changes in the economy.[17] Controls for overall demand will therefore include total male employment growth in the MSA, or the change in employment/population for older white males (i.e., those aged 35-54). The latter is close to the employment rate for prime-age males, which is often used in time-series work to control for aggregate demand. However, it is clearly endogenous for the total sample of whites and may control for some of what we are trying to measure through our industrial shift variables. We thus use both measures as alternative controls in estimated equations.

We also include a South dummy in some equations, which should control for differences across MSA's in legal (antidiscrimination) pressure, changes in the generosity of transfer or social insurance payments, and perhaps attitudinal changes as well. By estimating equations in changes rather than levels, we automatically difference away all unobserved fixed (i.e., time-invariant) characteristics of MSA's that may be correlated with our regressors. By estimating separate equations by age and education and by including supply shift variables, we also control for changes in the human capital characteristics of whites and blacks in our MSA's. We acknowledge that some other variables which may be correlated with industry shifts (e.g.,

[17]The years 1970 and 1980 were both characterized by mild recessions that raised prime-age male employment a bit. Between 1969 and 1970, the prime-age rate rose from 1.6 to 2.7; while between 1979 and 1980 it rose from 3.5 to 5.0.

changes in occupational compositions, employment suburbanization or crime) are not included here, though their effects might be interpretated as being part of the adjustments to observed industry shifts that are measured in the reduced-form wage and employment equations.

Finally, we note that industrial shifts during the 1980's have been at least as severe as those of the 1970's and must be considered in any such analysis. Since the PUMS files from the 1990 Census are not yet available, the complete analysis cannot be done for this period. However, we use coefficients for Equations 2) along with summary measures of outcomes and estimated industrial shifts from nationwide data during the 1980's to predict outcomes for this period as well. The results are briefly discussed below.

III. Empirical Results

A. Summary Results, 1970-80

WAGE AND EMPLOYMENT OUTCOMES

In Table 1 we present means and standard deviations of wage and employment/population changes for various groups of white and black males between 1970 and 1980, and of weekly wage changes between 1969 and 1979. (The exact definitions of variables and samples appear in the notes to Table 1.) The latter have also been deflated (by changes in the GNP deflator for Personal Consumption Expenditures) to produce changes in <u>real</u> weekly wages. Changes are defined as differences in logs of values for each year; the results can thus be interpreted as percent changes in each. The results appear separately for four education groups and for three age groups as well as for the total sample. Furthermore, some of the results appear disaggregated by region in Part B of the table. All means are weighted by white or black population in the MSA as of 1970.

The results show that employment/population fell for almost all groups of males during the 1970's, with only young males with college showing no decline. The largest declines appear for those with the lowest educational attainment. The deterioration was especially pronounced for black males. Indeed, employment declines are larger for blacks than for whites within each age and education category; and, for blacks, the largest declines occur among the young (Freeman and Holzer, 1986). We thus find that employment rates among young black high school dropouts decline by almost one-third over the decade, and for all black dropouts by a fourth.

As for wages, we find (as is well known) that blacks gained in real and relative to wages during the decade of the 1970's. The largest relative gains were achieved by older black males. Indeed, some deterioration in relative position is already apparent for the youngest cohort of blacks, which was to become even more pronounced during the 1980's (Bound and Freeman, 1990).

We also note that real wages were actually declining for most groups of younger white and black males during this period, especially for high school dropouts.[18] The growing gap between high school graduates and dropouts that has been noted by many for the 1980's (e.g., Bound and Johnson) had already appeared over the decade of the 1970's, though the gap between high school and college graduates had not. The magnitudes of the declines here should also partly reflect our focus on weekly wages, with declining hours worked per week being confounded with declining hourly wages.[19]

---

[18]The average within-educational group wage changes are generally more negative than overall wage changes, since improvements in educational attainments over the decade are reflected in the latter.

[19]Average weekly hours worked declined during the decade from 37.1 to 35.3, a decline of roughly 5% (Handbook of Labor Statistics, 1983). However, these published figures include students and females, and are therefore likely to

The results by region in Table 1B show that, for whites and especially for blacks, the largest employment declines occurred in the North-Central region. The declines among high school dropouts in this region are particularly severe. In contrast, those in the South and West are the least severe for both groups. We also note that the largest relative wage gains for blacks occur in the South, where pressures from equal opportunity legislation were the greatest (Freeman, 1981; Heckman and Payner, 1989).

INDUSTRY SHARES AND SHIFTS

To analyze this pattern of employment and wage changes, we will consider the distributions of whites and blacks across industries as well as the differences in growth rates across these industries. The employment distributions appear in Table 2. They are presented for whites and blacks as well as for education groups in 1970.

Several noteworthy findings appear in Table 2. For instance, we find that less-educated groups are more heavily concentrated in durable and non-durable manufacturing than are more-educated groups. Approximately 35% of all dropouts and 33% of all high school graduates in this sample of MSA's were employed in manufacturing in 1970, while these fractions are significantly lower for those with more education.

But we do not find a higher concentration of blacks than of whites in either durable or non-durable manufacturing. Instead, we find blacks somewhat more highly concentrated in private household/personal services (where high school dropouts are also relatively concentrated). In contrast, whites appear

---

overstate the magnitude of the actual decline for nonenrolled males.

to be more highly concentrated than blacks in the trade and financial services sectors, though the differences are fairly small.

In Table 3 we consider differences in growth rates across these industries. The growth rates appear as percent changes in the shares of all males who are employed in the industry - i.e., the change in the share as a fraction of the share in 1970. Using percent changes in shares has the advantage of controlling for overall employment growth in each MSA in the 1970's; thus, industries growing at below average rates will show declining shares. All growth rates here are presented for all MSA's and by region.

The results show that employment growth was most rapid in most of the service sectors, especially in business services. In contrast, employment declines (in percentage terms) were quite severe in the private household/personal service sector. The growth in other service sectors as well as the decline in private/personal services were especially pronounced in the South.

We also note that employment shares in manufacturing declined by almost 10%. While manufacturing employment did grow in the South and West, these growth rates were substantially lower than overall employment growth in these regions. Hence, the decline in the shares of manufacturing in these areas are quite pronounced as well, though generally smaller than in the Northeast and North-Central regions.

By combining data from Tables 2 and 3, we see that the decline in demand for any of our demographic groups caused by manufacturing was about 1% in the case of nondurables and 2-3% in the case of durables, even under the extreme assumption of no offsetting employment gains in other industries. By looking at certain race by education groups (e.g., black dropouts) the combined

magnitudes would clearly be larger, though not nearly so large as the employment declines which these groups experienced in this period (Table 1).

On the other hand, the declines in private services and manufacturing, as well as the growth of the other service sectors, do appear to be more pronounced in the 1970-80 decade than in the previous one.[20] Given that employment declines, especially for blacks, were much greater in the 1970-80 period as well, the possibility that some part of these declines may be linked to industrial shifts remains fairly strong.

At this point, we note that questions about the representativeness of our sample of 52 MSA's must be addressed. Comparing our summary measures in Tables 1 through 3 to published Census aggregates for the country overall, we find very similar declines in overall manufacturing's share of employment (about 11-12% overall in both cases) and fairly similar changes in employment, though the nationwide numbers are a bit more positive.[21]

In any event, we present some further evidence on the employment of whites and blacks in manufacturing in our sample of MSA's in Table 4. For each group in 1970 and 1980, shares of employment accounted for by durable and nondurable manufacturing (as well as total manufacturing) are presented, in total and by region.

These results show that employment in manufacturing declined over the decade for both whites and blacks. However, the decline in durables was fairly comparable between the two groups, while in non-durables we observe a

---

[20]Employment shares of white and black males in durable manufacturing remained fairly constant in the 1960's (at about 19-20% for each), though in nondurables they declined (from approximately 12 to 10%) for both groups.

[21]Changes in ln(employment/population) for males aged 16-54 nationwide were .009 for whites and -.110 for blacks respectively, compared to -.028 and -.132 from Table 1.

greater decline for whites. Thus, the decline for whites in overall manufacturing employment was greater.

By region, we note a particularly steep decline for blacks in durables in the North-Central region (where almost 46% of black men in the region were employed as of 1970). If anything, the decline was even steeper for younger cohorts than the numbers in Table 4 suggest.[22]

We also note a marked contrast in the South between steeply declining employment in non-durables for whites and growing employment there for blacks, though the pattern in durables was again more favorable for whites. Overall, manufacturing shares of employment for blacks in this region remained relatively stable, in contrast to the experience of those in the Midwest. The parallels between trends in manufacturing and in overall employment, especially for blacks, thus remain noteworthy.

Given the heavy initial concentration and subsequent decline of employment for blacks in durables in the North-Central area, it became natural to question the cause of this development. For instance, was the decline particularly serious for blacks because of growing "spatial mismatch" between suburban firms and central-city blacks in this region? Our tabulations of county-level employment data from firms in this area in the 1970's suggest that employment did decline more rapidly in areas where blacks were more likely to reside; but this was equally true of manufacturing and non-manufacturing employment. Thus, while "spatial mismatch" may have grown more severe during this decade, it does not explain the relative decline of durable

---

[22]According to tabulations of the CPS by the authors, employment of young, nonenrolled black males in durables constituted about 42% of the total in the early to mid-1970's but only about 31% by 1980. These tabulations were limited to blacks living in the East North Central region, who constituted about 85-90% of all blacks in the North Central region in 1970.

manufacturing employment in this region for blacks.[23] No other explanations for this decline are apparent to us at this time.

OTHER SUPPLY AND DEMAND MEASURES

In Table 5 we present means and standard deviations, overall and by region, on a few other variables that are relevant to this discussion. These variables include our indices of between-industry demand shifts (i.e., the D_{ik}), which are defined above in Section II; percent changes in the shares of the population accounted for by different demographic groups; and changes in employment/population for older white males (i.e.,aged 35-54).

The demand shift indices summarize the data of Tables 2 and 3 on distributions of demographic groups by industry and growth rates by industry; they indicate whether the sectors in which each group is concentrated are generally growing or declining. On the other hand, the changes in the population shares represent supply shifts; and employment changes for older white males can be thought as a control for overall demand conditions.

The results indicate that shifts between industries have caused demand to be reduced for blacks by about 1% and for high school dropouts by 2%. For black dropouts, the declines might therefore be as large as 3%. In contrast, these shifts caused demand for college graduates to rise by 9-10% relative to those for high school graduates and dropouts. These results are quite consistent with those of previous authors (e.g., Murphy and Katz, 1991) who

---

[23]The published data on which these tabulations are based are taken from County Business Patterns. They suggest a 10% greater decline in employment facing blacks than whites, based on county of residence. More details are available from the authors on these data. Of course, we note the caveat that counties are a fairly aggregated geographic unit for conducting such an analysis. The general evidence that "spatial mismatch" grew between 1970 and 1980 nationwide is discussed in Holzer (1991).

have constructed demand shift indices for different education groups in the 1970's and 1980's.[24]

We note, however, that the decline in demand for blacks appears to be largest in the South. The result thus appears to be driven largely by the big decline in private household/personal services, where blacks in the South were highly concentrated as of 1970. The decline of employment in this industry is most plausibly attributed to the opening of alternative opportunities for black workers rather than product demand shifts. Thus, we would not expect a shift away from this sector to necessarily hurt employment and/or wages in the same way as would a shift away from sectors such as manufacturing. The usefulness of fixed-weight indices that impose equal effects on such sectoral shifts are thus further called into doubt.[25]

The changes in population shares reveal growth for blacks overall, declines for high school dropouts, and increases for those with at least some college. These no doubt reflect higher population growth among blacks and the rising educational attainment of the population as a whole. The magnitudes of these shifts are also far larger than those indicated on the demand side, though we must remember that the latter include only the between-industry components of shifts.

---

[24]There are some disputes in the literature on the magnitudes of these relative demand shifts in the 1980's, with Bound and Johnson (1989) stressing that declining employment in the educational and public sectors partly offset the shifts in demand towards the more educated in other sectors. But these issues have little bearing on the magnitudes we present for the 1970's.

[25]The willingness of blacks to leave the private household/personal sector also suggests that shifts away from low-wage sectors may partly reflect exogenous shifts in labor supply as well as demand. As noted above, this limits our ability to interpret the indices strictly as demand shift variables.

In general, we note more rapid growth in educational attainment among blacks (even accounting for their higher rates of population growth). The declines in the shares of black dropouts and the increases in shares of blacks with high school degrees or some college are largest in the South.

Finally, we note the overall decline in employment/population for older white males, which is most pronounced in the North-Central region and least pronounced in the South and West. This pattern across regions is very comparable to that of manufacturing concentration and decline. It is therefore crucial to control for overall employment and demand conditions when analyzing the effects of industrial shifts on wage and employment outcomes below.

B. Regression Results, 1970-80

In this section we consider estimates from regression equations in which the wage and employment outcomes (summarized in Table 1) are the dependent variables and our measures of industrial shifts (i.e., the D_{ijk}) are the independent variables. As our D_{ijk} measure, we focus here on the percent change in the share of manufacturing in male employment, weighted by the relevant 1970 shares of either racial or educational groups (see pp. 6-7 for details). As noted above, these measures are more likely to represent exogenous product demand shifts than are indices which incorporate other industries.

These equations are generally of the form of Equation 2) above. Thus, we include controls for supply shifts (i.e., percent changes in population shares) of each group and for overall demand conditions in analyzing the effects of industrial shifts on wages and employment.

Four specifications of each equation are considered. The first (i.e., in col. 1) contains only a control for population growth. The second specification adds a dummy variable for being a Southern MSA, while in the third and the fourth we use the total employment growth of the MSA and the change in employment/population for older whites respectively. The equations presented in the next two tables are unweighted.[26]

Separate estimates are presented for whites and blacks. In Table 6 we present results of estimated equations for the overall samples, while in Table 7 we present estimated coefficients on D_{ijk} based on outcomes for the two youngest cohorts (ages 16-24 and 25-34) and for high school dropouts and graduates separately. Each table presents estimates from employment equations first followed by those from wage equations. The D_{ijk} measures in each case are for all ages combined, though these are constructed using race-specific employment shares (i.e., α_{ijk}) in Table 6 and education-specific shares in Table 7.[27]

The results of Table 6 show that shifts in manufacturing generally have positive and significant effects on employment changes for whites and blacks. Including controls for South and for overall demand generally reduce the magnitudes of these effects but do not eliminate them.

In general, the magnitudes of the employment effects are much larger for blacks than for whites. This is consistent with the notions that blacks are more hurt by declines in manufacturing, even though they are not more heavily

---

[26]Regressions of residuals on MSA population levels in employment equations showed virtually no evidence of heteroscedasticity and only weak evidence is wage equations (with t-statistics in the range of -1.0 to -1.3 at most).

[27]Results across the two sets of variables are very comparable, given the high correlations across the α's.

concentrated there. This could be true because their skills do not allow them to make transitions to other industries as quickly when manufacturing declines, or because the wages which they can obtain in these other industries are below their reservation wages. It might also reflect geographic barriers to or costs of relocation of blacks, who otherwise might move to other MSA's or to suburban areas within MSA's where manufacturing employment is more readily available.[28]

It is important to note that the supply shift variables in Table 6 have the expected negative coefficients in employment equations, which thus suggests that the growth of a more educated workforce may be counteracting the negative effects of demand shifts on less-skilled groups. However, the estimated magnitudes of these effects are generally too small to substantially change the impression that industry demand shifts contributed to the decline of black and less-skilled employment.[29]

We also note the positive effects on employment growth of southern residence and of older male employment rates, especially for blacks. The latter confirm the well-known findings (e.g., Cain and Finnie, 1989; Freeman, 1990) that overall demand levels in metropolitan areas have large effects on black employment, and that differences in demand levels as well as industrial structure across metropolitan areas and regions may constitute another dimension of geographic "mismatch."

In Table 7, we also note generally larger effects of manufacturing shifts on employment for high school dropouts than for the population as a

---

[28]For evidence on barriers to black relocations after firms move see Zax and Kain (1988).

[29]For instance, the decline in the share of black high school dropouts during the 1970's raised employment of this group by .04–.05.

whole, perhaps reflecting their greater difficulty in shifting to other industries (due to their limited skills and the costs of training); and larger effects on the youngest cohort, who are likely to bear the brunt of any structural shifts in the economy. Once again, effects for blacks are generally larger than for whites, even within age and/or education groups; by far the largest employment effects are thus observed for young black dropouts.

As for the effects of manufacturing shifts on wage changes, these effects are far more mixed. In general, the effects for the overall samples are more positive for blacks than for whites in Table 6, but they are generally not significant (especially after controlling for South). Table 7 shows that estimated wage effects for the 16-24 year old cohort are positive and sometimes significant, while those for the 25-34 year old cohort are often negative. Some of the estimated negative coefficients here may simply indicate that wage levels for certain groups, especially among the less-educated, were rising the most where their employment levels were falling in the 1970's.[30]

It is worth noting here that we have estimated a wide variety of other employment equations with somewhat different specifications. For instance, estimating the same equations for durable and non-durable manufacturing separately generate smaller positive (though less efficient) effects for durables and for nondurables.[31] Results from equations which are comparable

---

[30]Rising wages along with falling employment might reflect supply shifts caused, among other possibilities, by rising reservation wages (Holzer, 1986); or simply that other forces (such as unions, minimum wages, etc.) were raising wages in areas where manufacturing was declining (Lawrence and Lawrence, 1985).

[31]For instance, coefficients (and standard errors) for durable and nondurable manufacturing in equations comparable to those of column 1 in Table 6 are .294 (.113) and .123 (.192) for whites, .813 (.335) and .367 (.765) for blacks. However, the black coefficient on durables is much more sensitive to the

to those of Tables 6 and 7 but which are weighted by MSA population size have also been computed. These are quite similar and, if anything, many estimates are larger than in the unweighted case.[32]

Finally, we note that equations were estimated in which our demand indices D_{ik} were used as regressors instead of the manufacturing variables D_{ijk}. While employment effects were generally positive, they were far more varied in size and significance levels across demographic groups and far less robust with respect to changes in control variables. Given our greater skepticism about their exogeneity, we found these results less convincing and useful than those presented in our tables.

Returning now to our estimated employment and wage effects in Tables 6 and 7, we need to ascertain the magnitudes of the estimated coefficients of Tables 6 and 7. We do so by using them to predict declines in employment and annual earnings for our sample over the decade. Table 8 presents the results of these predictions, which can be compared with observed outcomes for the relevant groups in Table 1.

In each case, we present the largest and smallest (i.e., least positive) estimated coefficients from our four specifications. The annual earnings predictions are based on the sum of estimated effects on employment and weekly

---

inclusion of controls, while that for nondurables actually improves (.250 (.298) and .465 (.585) respectively for blacks) with the inclusion of controls from col. 4.

[32]For instance, coefficients (standard errors) on manufacturing from weighted equations for all black males, all of black dropouts, and young black dropouts (using the Column 1 specification) were approximately 1.41 (.47), 2.43 (.56), and 4.30 (1.46) respectively.

earnings.[33] Mean shares of employment in manufacturing in 1970 (from Tables 2 and 4) and mean percent changes in the overall shares accounted for by manufacturing during the decade (from Table 3) are multiplied to construct the predictors in this exercise. Results are presented by age and education in Part A and by education and region in Part B of Table 8.

The results of Table 8 show that manufacturing declines during the 1970's can, for particular groups, account for substantial portions of declining employment and earnings observed during that decade. In many cases, the gaps between our lowest and highest estimates are fairly large, so we cannot know the exact magnitudes very precisely. Furthermore, the magnitudes of effects vary substantially across groups. In general, we find larger effects for blacks than for whites and for dropouts than graduates, though this is not often true when the effects are measured as fractions of the much larger declines in employment which the latter groups have experienced.

For many groups, we find that the lowest estimates of employment declines can account for about 10-15% of observed declines in Table 1, while the largest can account for about 20-30%. There are some cases (e.g., white graduates aged 16-24) where the small observed declines can be mostly or fully accounted for by either the lowest or highest estimates; in other cases (e.g., all black high school graduates), our estimates explain very little of observed declines.

---

[33]Since ln(annual earnings) can be decomposed into the sum of ln(weekly earnings) and ln(weeks worked), and since the latter ln(employment/population)+ln(50), the derivative of annual earnings with respect to any independent variable can be approximated by the sum of estimated coefficients for each with respect to that variable. We note that coefficients used to predict annual earnings here are always based on the same specification in employment and wage equations.

For black dropouts in general, the large predicted effects constitute about 20-30% of observed employment declines; but for black dropouts in the 16-24 age group, the declines account for about 35-50% of observed outcomes. In other words, up to half of the huge employment declines observed among young less-educated blacks might be explained by industrial shifts away from manufacturing towards other sectors. Furthermore, if weighted estimates (from footnote 32) had been used (or cohort-specific shares and declines in manufacturing employment as predictors), these estimates would be even larger than those presented.[34]

The predicted effects on earnings are generally larger than those for employment, though in a few cases (e.g., white dropouts and black graduates of all ages combined) the effects become smaller. The earnings effects are again largest for young dropouts, especially blacks, who experienced real wage as well as employment losses during the 1970's.

When we consider the predicted effects of manufacturing declines by region in part B of Table 8, we note that the largest predicted declines in employment and earnings are observed for the North-Central and Northeast regions. This is especially true for blacks and for dropouts there. The predicted effects for black dropouts in these regions again account for about 20-30% of the observed employment declines observed there, with even larger effects for younger cohorts (though these do not appear in Table 8 by region).

The results of Tables 6-8 also imply fairly large effects on the employment and earnings of young blacks and whites in the 1980's. Between

---

[34] Using weighted standard deviations of the independent variables here rather than weighted means as the predictors, and comparing predictions to observed standard deviations in outcomes, we obtain fairly similar results to those described in the text for most demographic groups.

1980 and 1989, the percent decline in the share of manufacturing in overall employment of males was about .115, which is very close to what it was in the 1970's.[35] This suggests that industry shifts in the latter decade may have had comparable, additional effects on earnings to those in the former one.

Of course, most analyses of labor market outcomes suggest that there was relatively greater wage rigidity (and thus greater employment responsiveness) in the 1970's and greater wage responsiveness in the 1980's. Indeed, employment actually rose for most groups in the 1980-89 period, due to a combination of cyclical and demographic factors;[36] and this was particularly true in the Northeast (though less so in the Midwest). But real wages were rising for college grads and declining for male high school grads and especially dropouts in this period (see references in Footnote 5). Thus, these outcomes are still quite consistent with the notion of labor demand shifting away from less-educated towards more educated groups of males.

Accordingly, we can use the employment and wage coefficients from Tables 6 and 7 to predict effects on annual earnings for the 1980's, assuming that the sum of employment and wage effects over the two decades has remained constant.[37]Given the similarity of industrial shifts between the two decades,

---

[35]The decline in durables employment was about 14.1%, which is greater than that for 1970-80; while the decline in non-durables was about 5.7%, which is smaller than the decline for the earlier period. We note again that the cyclical improvement in the later period contributes to a smaller decline than we otherwise would have seen, making the overall declines appear quite comparable between the two periods.

[36]The aggregate unemployment rate fell from 7.1% to 5.2% between 1980 and 1989, while the prime age male rate fell from 5.0% to 4.1%. The fraction of the population (aged 16 and over) accounted for by teens fell from 9.8% to 7.6% during this time as well.

[37]Under perfect flexible wages, the assumption of a constant sum of wage and employment responses to demand shocks implies that $(\epsilon+1)/(\epsilon+\eta)$ is constant (see Footnote 13); while under perfectly fixed wages, this assumption implies that the

we would again find that these shifts had relatively small effects on the annual earnings of most males in the 1980's, but larger ones for younger and/or less-educated whites and especially blacks (in absolute terms and as percentages of observed changes).

Overall, the combined effects of industry shifts over the 1970's and 1980's on earnings and employment for these latter groups thus appear to be quite substantial. But more precise estimates of effects from the 1980's, and how they varied across regions and MSA's, must await the availability of micro data from the 1990 Census.

IV. Conclusion

In this paper we present estimates of the effects of industrial shifts on the wages and employment of white and black men. We use micro Census data for 52 MSA's for the period 1970-80 for our estimation. We estimate these effects separately for different age groups and especially for different educational groups, since we would expect that shifts in demand away from traditional industries such as manufacturing to create particular disadvantages for less-skilled workers. In this sense, some light is shed on the notion of "skill mismatch".

Our results show that, because of industrial shifts, demand has shifted away from blacks and from less-skilled workers in the 1970's and 1980's. Our regression results also indicate that the decline in manufacturing has reduced employment among both whites and blacks. The effects on blacks are generally

---

sum is one (since the wage effect is zero and the employment effect equals the demand shock). A labor demand elasticity of one is necessary and sufficient for the assumption to hold in both polar cases, and recent estimates suggest that this is a reasonable assumption (Hamermesh, 1986).

larger than those for whites, and those on the young and less-educated (especially among blacks) are largest of all. While the decline in manufacturing appears to only explain fairly small fractions of the overall declines in black or white employment during the 1970's, for the young and less-educated the magnitudes are more substantial - as much as one-third to one-half of the large employment declines for young black dropouts can be thus explained. There also appear to be some negative effects of these shifts on wages, though these effects are much more mixed. These data also imply fairly substantial declines in annual earnings of young and less-skilled males in the 1980's, during which employment in manufacturing continued to decline.

Overall, the generally small effects on earnings and employment that we find for industrial shifts indicate that these forces were certainly not alone in creating the employment and wage problems of blacks and less-educated workers in the 1970's and 1980's. This is consistent with the results of most other studies of the declining real earnings of less-skilled males in the 1970's and 1980's.

On the other hand, industrial shifts do appear to have played a major role in reducing employment of less-educated black males, especially among the young. Differences in employment outcomes due to overall demand levels as well as industrial structure across MSA's also suggest that geographic factors play a role in employment problems of less-educated whites and blacks.

The results are thus at least partially consistent with the notion of "skill mismatch". Such mismatches may be transitional in nature, and should diminish as workers move and their skills adjust to the new industrial structure; but at least the skill adjustments will presumably take years or even decades to complete, as new cohorts with higher education levels

gradually enter the labor force. Furthermore, the results might also reflect more fundamental problems (such as relatively high reservation wages and alternative income sources) that limit adjustments and which may also be quite persistent.

With data from the 1990 Census, we should be able to get a clearer picture of how industrial shifts affected the employment and earnings of white and black males in various regions and MSA's in the 1980's. The interactions between these and other potential sources of low employment for black males (such as "spatial mismatch", social isolation of the poor, criminal activity, etc.) that are often stressed in the literature but are not controlled for in these data also need to be made more clear. Thus, a long agenda for future work remains.

REFERENCES

Abraham, Katherine and Lawrence Katz. "Cyclical Unemployment: Sectoral Shifts or Aggregate Disturbances?" Journal of Political Economy. June, 1986.

Bluestone, Barry and Bennett Harrison. The Deindustrialization of America. Basic Books, 1982.

Acs, Gregory and Sheldon Danziger. "Educational Attainment, Industrial Structure, and Male Earnings, 1973-87." University of Michigan, 1990.

Bound, John and Richard Freeman. "What Went Wrong? The Erosion of Black Earnings Gains in the 1980's". Mimeo, 1990.

Bound, John and George Johnson. "Changes in the Structure of Wages During the 1980's: An Evaluation of Alternative Explanations." NBER Working Paper, 1989.

Blackburn, McKinley, David Bloom and Richard Freeman. "The Declining Wages of Less-Skilled Males in the U.S." NBER Working Paper, November 1989.

Borjas, George. "The Demographic Determinants of the Demand for Black Labor", in R. Freeman and H. Holzer eds. The Black Youth Employment Crisis. University of Chicago Press, 1986.

Cain, Glen and Ross Finnie. "The Black-White Difference in Youth Employment: Evidence for Demand-Side Factors." Institute for Research on Poverty Working Paper, 1989.

Clark, Kim and Lawrence Summers. "The Dynamics of Unemployment Reconsidered." Brookings Papers on Economic Activity, 1979:1.

Freeman, Richard. "Black Economic Progress Since 1964: Who Has Gained and Why." In S. Rosen ed. Studies in Labor Markets. University of Chicago Press, 1981.

Freeman, Richard. "Economic Determinants of Individual and Geographic Variation in Employment Outcomes of Youth." In R. Freeman and D. Wise eds. The Youth Labor Market. University of Chicago Press, 1982.

Freeman, Richard. "Employment and Earnings of Disadvantaged Young Men in a Labor Shortage Economy." NBER Working Paper No. 3444, 1990.

Freeman, Richard. "Fixed-Coefficient Models and Manpower Analysis: A Synthesis." in R. Ehrenberg ed. Research in Labor Economics, Vol. 1, 1977.

Freeman, Richard and Harry J. Holzer. The Black Youth Employment Crisis, University of Chicago Press, 1986.

Hamermesh, Daniel. "The Demand for Labor in the Long-Run. "In O. Ashenfelter and R. Layard eds. Handbook of Labor Economics. North-Holland, 1986.

Heckman, James and Brook Payner. "Determining the Impact of Federal Antidiscrimination Policy on the Economic Status of Blacks: A Study of South Carolina." American Economic Review, March 1989.

Holzer, Harry J. "Reservation Wages and their Labor Market Effects for Black and White Youth." Journal of Human Resources, Spring 1986.

Holzer, Harry J. "The Spatial Mismatch Hypothesis: What Has the Evidence Shown?" Urban Studies, forthcoming in 1991.

Holzer, Harry J. "Structural/Frictional and Demand-Deficient Unemployment in Local Labor Markets." NBER Working Paper, 1988.

Hughes, Mark. "Mispeaking Truth to Power: A Geographical Perspective on the "Underclass" Fallacy." Mimeo, January 1989.

Johnson, James and Melvin Oliver. "Industrial Restructuring and the Employment of Inner-City Black Males." Mimeo, UCLA, 1991.

Juhn, Chinhui, Kevin Murphy and Brooks Pierce. "Accounting for the Slowdown in Black-White Wage Convergence". Mimeo, 1989.

Kasarda, John. "Urban Industrial Transition and the Underclass." The Annals of the American Academy of Political and Social Science. January 1989.

Katz, Lawrence and Kevin Murphy. "Changes in Relative Wages, 1963-87: Supply and Demand Factors." Quarterly Journal of Economics, forthcoming 1991.

Krueger, Alan and Lawrence Summers. "Reflections On the Interindustry Wage Structure." Econometrica, 1988.

Lawrence, Colin and Robert Lawrence. "Manufacturing Wage Dispersion: An End Game Interpretation." Brookings Papers on Economic Activity. 1985:1.

Lilien, David. "Sectoral Shifts and Cyclical Unemployment." Journal of Political Economy. July, 1982.

Massey, Douglas and Mitchell Eggers. "The Ecology of Inequality: Minorities and the Concentration of Poverty 1970-80." American Journal of Sociology, 1990.

Wilson, William J. The Truly Disadvantaged. University of Chicago Press, 1987.

Zax, Jeffrey and John Kain. "Race and Workplace-Residence Equilibrium." Unpublished, 1988.

Table 1
Weekly Wage and Employment/Population Changes for
White and Black Males, 1970-80:
Means and Standard Deviations

A. All MSA's

Employment

	Whites				Blacks			
Ages:	All	16-24	25-34	35-54	All	16-24	25-34	35-54
Education: All	-.028	-.007	-.031	-.023	-.132	-.180	-.147	-.092
	(.021)	(.052)	(.023)	(.014)	(.075)	(.136)	(.081)	(.055)
HS Dropouts	-.100	-.081	-.111	-.074	-.251	-.329	-.304	-.163
	(.043)	(.105)	(.065)	(.027)	(.105)	(.204)	(.156)	(.075)
HS Graduates	-.047	-.029	-.060	-.034	-.143	-.203	-.181	-.095
	(.023)	(.052)	(.026)	(.015)	(.071)	(.129)	(.080)	(.064)
Some College	-.008	.061	-.029	-.017	-.077	-.023	-.108	-.068
	(.015)	(.050)	(.021)	(.014)	(.074)	(.186)	(.132)	(.074)
College Graduates	-.004	.052	-.005	-.009	-.045	.044	-.052	-.043
	(.010)	(.062)	(.015)	(.010)	(.048)	(.295)	(.082)	(.049)

Real Wages

	Whites				Blacks			
Ages:	All	16-24	25-34	35-54	All	16-24	25-34	35-54
Education: All	-.013	.004	-.054	.076	.062	-.017	.010	.148
	(.047)	(.078)	(.059)	(.045)	(.083)	(.141)	(.105)	(.083)
HS Dropouts	-.112	-.067	-.156	.001	-.027	-.056	-.098	.073
	(.063)	(.092)	(.092)	(.068)	(.086)	(.183)	(.136)	(.090)
HS Graduates	-.065	-.007	-.085	.013	.024	-.050	-.044	.083
	(.052)	(.093)	(.065)	(.049)	(.091)	(.145)	(.137)	(.103)
Some College	-.045	.073	-.106	-.010	.009	-.096	-.068	.108
	(.061)	(.096)	(.075)	(.054)	(.142)	(.280)	(.201)	(.143)
College Graduates	-.068	-.006	-.114	-.009	-.025	.068	-.099	.054
	(.050)	(.137)	(.056)	(.048)	(.130)	(.525)	(.193)	(.161)

NOTE: Both employment/population and wage measures are defined as differences in logs between 1970 and 1980 for the former or between 1979 and 1969 for the latter. The sample used here is the civilian, non-institutionalized and non-enrolled population. Employed is defined as of the census week. For weekly earnings, we calculated the average log(wage and salary income/imputed weeks worked) for

Table 1 (cont'd)

B. By Region - All Ages

Employment

	Whites				Blacks			
	NE	NC	S	W	NE	NC	S	W
Education: All	-.031	-.047	-.015	-.005	-.145	-.201	-.082	-.059
	(.012)	(.018)	(.016)	(.010)	(.059)	(.066)	(.042)	(.012)
HS Dropouts	-.105	-.141	-.074	-.058	-.255	-.351	-.173	-.217
	(.026)	(.036)	(.033)	(.023)	(.087)	(.091)	(.065)	(.033)
HS Graduates	-.052	-.066	-.030	-.027	-.152	-.209	-.088	-.110
	(.014)	(.022)	(.018)	(.008)	(.052)	(.068)	(.040)	(.018)
Some College	-.010	-.022	.000	.009	-.102	-.108	-.049	-.011
	(.009)	(.011)	(.015)	(.008)	(.069)	(.070)	(.065)	(.034)
College Graduates	-.008	-.006	.000	.004	-.057	-.058	-.029	-.026
	(.009)	(.006)	(.012)	(.004)	(.049)	(.042)	(.048)	(.031)

Wages

	Whites				Blacks			
	NE	NC	S	W	NE	NC	S	W
Education: All	-.032	-.001	.020	-.045	-.008	.046	.152	.025
	(.033)	(.027)	(.064)	(.030)	(.044)	(.045)	(.064)	(.032)
HS Dropout	-.107	-.079	-.099	-.201	-.080	-.054	.054	-.066
	(.040)	(.033)	(.070)	(.053)	(.058)	(.060)	(.076)	(.040)
HS Graduates	-.094	-.045	-.043	-.075	-.039	.023	.104	-.068
	(.046)	(.032)	(.067)	(.029)	(.041)	(.055)	(.087)	(.044)
Some College	-.083	-.019	-.033	-.032	-.133	.022	.117	.013
	(.049)	(.043)	(.084)	(.019)	(.069)	(.081)	(.122)	(.149)
College Graduates	-.108	-.048	-.037	-.064	-.085	-.033	.032	-.026
	(.029)	(.030)	(.065)	(.025)	(.065)	(.126)	(.163)	(.047)

NOTE (cont'd) those with positive weeks worked and wage and salary income. To impute weeks worked we replaced the 1970 categories 1-13, 14-26, 27-39, 40-47, 48-49 and 50-52 with cell averages calculated using the 1980 census. For consistency, we calculated weeks worked in the same way for 1980. Means are weighted by white and black employment or population respectively. The change in the log of the GNP deflator for Personal Consumer Expenditures over the 1969-79 period is used to calculate real-wage changes.

Table 2
Employment Shares of
Demographic Groups by Industry, 1970-

	Whites	Blacks	HS Dropouts	HS Grads	Some College	College Graduates
Ag., For. & Fish	.012	.019	.020	.010	.007	.006
Mining	.005	.003	.005	.004	.004	.007
Construction	.091	.095	.127	.089	.061	.029
Durable Mfg.	.222	.218	.245	.233	.204	.157
Non-durable Mfg.	.098	.085	.105	.097	.090	.083
Transportation	.074	.103	.090	.092	.069	.023
Comm. and Util.	.037	.045	.033	.049	.040	.025
Wholesale Trade	.061	.045	.052	.062	.080	.053
Retail Trade	.124	.113	.135	.136	.133	.065
Finance, Ins. and Real Estate	.052	.037	.026	.045	.084	.090
Business Services	.023	.018	.016	.020	.032	.036
Repair Services	.020	.024	.027	.022	.015	.006
Pri./Pers. Services	.020	.037	.030	.022	.020	.007
Ent. & Rec.	.010	.010	.010	.010	.012	.009
Health	.027	.033	.015	.013	.018	.010
Education	.036	.032	.015	.013	.017	.145
Other Prof.	.033	.028	.015	.018	.045	.093
Public Ad.	.055	.058	.024	.065	.067	.067
All Industries	1.000	1.000	1.000	1.000	1.000	1.000

Table 3

Percent Changes in Employment Shares of All Males by Industry, 1970-80: All MSA's and by Region

	All	NE	NC	S	W
Ag., For. & Fish	-.059	.011	-.119	-.143	.042
Mining	.013	-.050	.058	.160	-.167
Construction	.026	-.036	.046	.074	.046
Durable Mfg.	-.117	-.123	-.108	-.119	-.120
Non-Durable Mfg.	-.084	-.116	-.092	-.060	-.038
Transportation	.004	-.007	.024	-.010	.011
Comm. and Util.	-.070	-.074	-.067	-.045	-.108
Wholesale Trade	.041	.076	.038	-.000	.033
Retail Trade	.004	-.032	.053	-.003	-.002
Finance, Ins., R.E.	.091	.068	.091	.107	.116
Business Services	.689	.622	.700	.808	.622
Repair Services	.042	.041	.094	-.012	.034
Pri/Personal Serv.	-.235	-.277	-.190	-.260	-.190
Ent. and Rec.	.295	.294	.400	.205	.241
Health/Legal	.467	.445	.533	.425	.456
Education	.150	.234	.179	.060	.054
Other Prof.	-.006	-.031	-.012	.031	.004
Public Ad.	.071	.122	.106	.072	-.109

NOTE: Percent changes in employment shares defined as $\Delta share/share_{70}$ of total male employment accounted for by each industry.

Table 4

Manufacturing Shares of Employment By Race and Region: 1970 and 1980

	TOT	NE	NC	S	W
1970-Whites					
Total Mfg.	.320	.305	.415	.271	.292
Dur. Mfg.	.222	.189	.313	.114	.220
N. Dur. Mfg.	.098	.116	.102	.157	.072
1980-Whites					
Total Mfg.	.281	.266	.373	.205	.260
Dur. Mfg.	.194	.165	.282	.130	.191
N. Dur. Mfg.	.087	.101	.091	.075	.069
%Δ-Whites					
Total Mfg.	-.122	-.128	-.101	-.244	-.110
Dur. Mfg.	-.126	-.127	-.099	.140	-.132
N. Dur. Mfg.	-.112	-.129	-.108	-.522	-.042
1970-Blacks					
Total Mfg.	.303	.268	.455	.215	.257
Dur. Mfg.	.218	.167	.370	.138	.194
N. Dur. Mfg.	.085	.101	.085	.077	.063
1980-Blacks					
Total Mfg.	.277	.240	.404	.211	.235
Dur. Mfg.	.192	.142	.323	.127	.174
N. Dur. Mfg.	.085	.098	.081	.084	.061
%Δ-Blacks					
Total Mfg.	-.086	-.104	-.112	-.019	-.086
Dur. Mfg.	-.119	-.150	-.127	-.080	-.103
N. Dur. Mfg.	.000	-.030	-.047	.091	-.032

Table 5

Demand Shifts, Population Change, and Other Factors - Means (and Standard Deviations)

	All	NE	NC	S	W
Demand Shifts					
Whites	.002	.001	.001	.004	.000
	(.004)	(.001)	(.001)	(.006)	(.001)
Blacks	-.010	-.007	-.010	-.017	-.002
	(.016)	(.013)	(.007)	(.023)	(.014)
Dropouts	-.021	-.026	-.020	-.019	-.014
	(.012)	(.009)	(.009)	(.015)	(.008)
HS Graduates	-.013	-.016	-.012	-.011	-.014
	(.007)	(.005)	(.006)	(.011)	(.004)
Some College	.007	.008	.008	.010	.000
	(.014)	(.010)	(.009)	(.021)	(.009)
College Grads	.075	.092	.079	.062	.052
	(.027)	(.019)	(.014)	(.034)	(.016)
Percent Changes in Population Shares					
Whites, All	-.025	-.024	-.023	-.024	-.030
	(.019)	(.020)	(.008)	(.027)	(.015)
Dropouts	-.413	-.435	-.414	-.436	-.335
	(.072)	(.046)	(.027)	(.076)	(.103)
HS Graduates	-.002	.001	.037	.030	-.125
	(.093)	(.077)	(.057)	(.106)	(.032)
Some College	.304	.370	.327	.276	.165
	(.133)	(.104)	(.122)	(.133)	(.085)
College Graduates	.397	.432	.374	.422	.332
	(.094)	(.096)	(.057)	(.114)	(.057)
Blacks, All	.157	.168	.151	.108	.306
	(.112)	(.008)	(.049)	(.117)	(.089)
Dropouts	-.235	-.205	-.184	-.308	-.228
	(.106)	(.114)	(.064)	(.084)	(.115)
HS Graduates	.425	.377	.332	.568	.358
	(.201)	(.096)	(.119)	(.261)	(.121)
Some College	1.400	1.373	1.278	1.620	1.103
	(.453)	(.165)	(.312)	(.646)	(.231)
College Graduates	1.358	1.388	1.219	1.349	1.705
	(.747)	(.427)	(.799)	(.936)	(.445)
Emp./Pop. Change, Older White Males	-.024	-.028	-.032	-.016	-.011
	(.014)	(.008)	(.013)	(.014)	(.009)

NOTE: Demand shifts are measured as $\Sigma_j \alpha_{ij} \dot{x}_j$ where i denotes group, j denotes industry, α's are shares (from Table 2) and $\dot{x}_j$'s are changes in industry shares (Table 3). Population share changes defined comparably to industry share changes where shares are defined as shares of total male population. Employment changes for older white males are defined as differences in logs of employment-to-population ratios for ages 35-54.

Table 6

Employment and Wage Change Equations:
Manufacturing Effects, 1970-80

Employment

	Whites				Blacks			
	1	2	3	4	1	2	3	4
Intercept	-.017	-.028	-.038	-.011	-.059	-.091	-.057	-.025
	(.005)	(.006)	(.016)	(.004)	(.017)	(.022)	(.057)	(.023)
Mfg. Change	.393	.305	.249	.153	.990	.740	.913	.508
	(.115)	(.113)	(.141)	(.066)	(.333)	(.345)	(.437)	(.292)
South	---	.015	.014	.008	---	.041	.044	.019
	---	(.006)	(.006)	(.003)	---	(.020)	(.021)	(.017)
Emp. Change	---	---	.011	---	---	---	-.035	---
	---	---	(.016)	---	---	---	(.054)	---
Emp./Pop. Change, Older Whites	---	---	---	1.055	---	---	---	2.327
	---	---	---	(.104)	---	---	---	(.498)
Pop. Change	-.109	-.119	-.148	.056	-.082	-.048	-.066	-.119
	(.099)	(.093)	(.103)	(.055)	(.001)	(.061)	(.068)	(.053)
R^2	.212	.316	.322	.786	.180	.246	.252	.486

Wages

	Whites				Blacks			
	1	2	3	4	1	2	3	4
Intercept	.623	.598	.605	.609	.792	.712	.715	.721
	(.014)	(.017)	(.023)	(.022)	(.022)	(.026)	(.035)	(.035)
Mfg. Change	.100	-.111	-.012	-.172	.850	.220	.254	.190
	(.311)	(.311)	(.390)	(.321)	(.446)	(.408)	(.518)	(.418)
South	---	.037	.040	.034	---	.102	.103	.096
	---	(.016)	(.017)	(.016)	---	(.024)	(.024)	(.025)
Emp. Change	---	---	-.019	---	---	---	-.007	---
	---	---	(.045)	---	---	---	(.065)	---
Emp./Pop. Change, Older Whites	---	---	---	.422	---	---	---	.301
	---	---	---	(.509)	---	---	---	9.709)
Pop. Change	-1.057	-1.079	-1.028	-1.009	-.188	-.102	-.106	-.111
	(.289)	(.257)	(.286)	(.272)	(.082)	(.073)	(.084)	(.076)
R^2	.242	.320	.323	.330	.157	.395	.395	.397

NOTE: Dependent variables are defined as in Table 1. Manufacturing change is defined as percent change in share of employment (see Table 3) weighted by appropriate share of demographic group's employment in 1970 (see Table 2). Other variables are defined in text or previous tables.

Table 7

Manufacturing Effects by Age and Education

A. Employment Effects

	Whites				Blacks			
	1	2	3	4	1	2	3	4
All Ages								
HS Dropouts	.666	.452	.477	.220	1.913	1.592	1.561	1.309
	(.204)	(.200)	(.245)	(.149)	(.409)	(.416)	(.520)	(.372)
HS Graduates	.346	.205	.169	.171	.445	.177	.443	-.077
	(.113)	(.100)	(.119)	(.081)	(.378)	(.351)	(.425)	(.329)
Ages 16-24								
HS Dropouts	1.267	.783	.549	.466	3.364	4.204	3.450	3.995
	(.590)	(.608)	(.707)	(.604)	(1.720)	(1.781)	(2.186)	(1.829)
HS Graduates	.876	.718	.589	.613	.862	.448	.742	.072
	(.260)	(.268)	(.317)	(.255)	(.780)	(.775)	(.944)	(.730)
Ages 25-34								
HS Dropouts	.897	.596	.669	.374	2.327	1.542	.859	1.297
	(.303)	(.299)	(.368)	(.266)	(.824)	(.809)	(.980)	(.812)
HS Graduates	.275	.177	.160	.143	1.601	1.242	1.369	1.058
	(.140)	(.129)	(.159)	(.124)	(.452)	(.417)	(.501)	(.417)

B. Wage Effects

All Ages								
HS Dropouts	-.201	-.342	-.125	-.329	.884	.319	.333	.435
	(.323)	(.342)	(.416)	(.356)	(.553)	(.540)	(.674)	(.549)
HS Graduates	.283	.187	.379	.138	.674	.367	.394	.419
	(.349)	(.369)	(.437)	(.363)	(.602)	(.592)	(.726)	(.614)
Ages 16-24								
HS Dropouts	1.490	.594	-.021	.451	.927	.284	-.171	.145
	(.662)	(.621)	(.702)	(.641)	(1.364)	(1.414)	(1.733)	(1.453)
HS Graduates	1.156	0.863	0.704	0.696	-.496	-.634	-.985	-.778
	(.560)	(.582)	(.690)	(.573)	(1.955)	(1.983)	(1.228)	(1.008)
Ages 25-34								
HS Dropouts	.364	.003	.595	.026	.377	-.186	-.266	-.323
	(.591)	(.615)	(.744)	(.636)	(1.019)	(1.169)	(1.439)	(1.120)
HS Graduates	-.310	-.360	-.077	-.395	1.383	1.056	.809	1.118
	(.399)	(.411)	(.503)	(.416)	(.960)	(.980)	(1.178)	(1.016)

NOTE: Columns 1-4 correspond to those of Table 6. Manufacturing shifts calculated using α's based on educational groups.

Table 8

Predicted Effects of Manufacturing Decline on Employment and Earnings, 1970-80

A. Total

	Whites				Blacks			
	Emp./Pop.		Annual Earnings		Emp./Pop.		Annual Earnings	
	LO	HI	LO	HI	LO	HI	LO	HI
All Ages								
All Ed.	-.005	-.014	.001	-.017	-.017	-.033	-.023	-.061
HS Dropouts	-.008	-.026	.004	-.018	-.050	-.074	-.069	-.108
HS Graduates	-.006	-.012	-.011	-.022	.003	-.016	-.012	-.039
Ages 16-24								
HS Dropouts	-.018	-.049	-.020	-.106	-.130	-.162	-.126	-.165
HS Graduates	-.021	-.031	-.046	-.072	-.003	-.030	.025	-.013
Ages 25-34								
HS Dropouts	-.014	-.035	-.014	-.049	-.033	-.090	-.023	-.104
HS Graduates	-.005	-.010	.009	.001	-.038	-.056	-.077	-.105

NOTE: Predictions are based on coefficients from Tables 6 and 7 and from mean changes in (demographically-weighted) manufacturing shares of employment. "LO" and "HI" refer to smallest and largest coefficient estimates respectively out of four specifications in previous tables. Annual earnings effects are sums of employment and weekly wage effects.

Table 8 (cont'd)

Predicted Effects of Manufacturing Decline
on Employment and Earnings, 1970-80

B. By Region

	Whites				Blacks			
	Emp./Pop.		Annual Earnings		Emp./Pop.		Annual Earnings	
	LO	HI	LO	HI	LO	HI	LO	HI
Northeast								
All Ed.	-.005	-.015	.001	-.018	-.016	-.032	-.022	-.060
HS Dropouts	-.008	-.027	.004	-.017	-.051	-.077	-.069	-.110
HS Graduates	-.006	-.013	-.011	-.023	.004	-.017	-.013	-.040
North-Central								
All Ed.	-.007	-.018	.001	-.022	-.025	-.049	-.034	-.091
HS Dropouts	-.010	-.033	.005	-.023	-.063	-.093	-.085	-.135
HS Graduates	-.008	-.015	-.015	-.028	.004	-.020	-.015	-.050
South								
All ED.	-.004	-.010	.000	-.012	-.011	-.020	-.016	-.042
HS Dropouts	-.005	-.016	.003	-.011	-.030	-.044	-.040	-.063
HS Graduates	-.004	-.009	-.008	-.014	.002	-.011	-.008	-.026
West								
All Ed.	-.004	-.011	.001	-.014	-.014	-.027	-.018	-.048
HS Dropouts	-.007	-.021	.003	-.015	-.041	-.060	-.053	-.085
HS Graduates	-.005	-.010	-.009	-.018	.003	-.013	-.010	-.032

Appendix A
1970 Characteristics of the 52 MSA's

	Population (1000's)		Industry Employment percent					
	White	Black	Manufacturing	Trade	Misc. Services	Education	Construction	Government
Akron, OH	623	54	39.3	19.4	6.0	8.0	4.6	12.3
Atlanta, GA	1078	310	19.7	23.5	9.5	6.8	6.4	15.4
Austin, TX	262	32	8.7	19.3	10.1	15.3	8.4	34.8
Baltimore, MD	1571	490	25.2	19.4	7.1	7.4	6.2	21.0
Beaumont, TX	248	67	29.9	20.3	8.7	7.6	7.8	11.4
Birmingham, AL	521	217	24.6	22.3	9.4	6.6	5.7	13.1
Boston, MA	2606	126	22.4	21.0	7.1	9.5	5.0	15.6
Buffalo, NY	1232	109	33.4	21.0	5.8	8.5	4.3	15.5
Chicago, IL	5685	1228	31.7	20.8	7.4	6.2	4.8	11.7
Cincinnati, OH	1229	152	32.7	20.4	7.2	6.6	5.2	12.2
Cleveland, OH	1723	333	35.4	19.7	6.8	6.5	4.6	12.4
Columbia, SC	237	84	17.9	20.7	9.2	9.5	8.6	23.6
Columbus, OH	806	106	23.4	21.3	6.9	9.8	5.6	19.4
Dallas, TX	1299	247	23.4	23.1	9.6	6.2	6.7	11.1
Dayton, OH	754	94	37.4	18.3	6.6	7.1	4.4	15.8
Detroit, MI	3424	757	37.4	19.8	6.6	6.6	4.3	12.1
Fort Laudrdle, FL	541	77	11.8	25.8	13.2	5.7	11.8	12.0
Gary, IN	519	112	44.2	17.3	5.2	7.0	5.8	10.3
Greensborough, NC	484	118	38.7	18.2	6.9	7.2	5.7	10.9
Harrisburg, PA	381	28	21.8	19.2	5.9	7.0	6.4	23.4
Houston, TX	1591	382	20.5	22.4	10.0	6.6	9.4	10.8
Indianapolis, IN	970	137	29.2	21.6	6.6	6.2	5.4	13.7
Jacksonville, FL	407	118	12.3	25.2	10.4	6.5	7.3	17.2
Jersey City, NJ	543	61	34.7	16.8	7.0	4.5	3.7	12.4
Kansas City, MO	1098	151	22.7	23.2	7.3	6.2	5.7	14.6
Knoxville, TN	372	28	26.9	20.4	8.3	10.3	6.8	20.4
Las Vegas, NV	245	25	4.6	18.5	30.9	5.1	8.5	14.5
Little Rock, AR	263	60	20.1	21.3	8.6	6.3	6.4	18.8
Los Angeles, CA	6030	763	27.3	20.7	9.1	6.9	4.5	14.0
Louisville, KY	724	101	33.6	20.1	7.2	6.6	5.4	13.2
Memphis, TN	479	289	20.4	23.4	11.0	7.2	5.5	17.6
Miami, FL	1073	190	14.8	23.5	13.4	6.2	6.9	11.9
Milwaukee, WI	1289	107	35.1	20.8	5.9	7.0	4.3	12.2
Mobile, AL	263	113	22.7	21.5	9.7	7.0	7.7	15.7
New Orleans, LA	719	324	14.1	23.5	10.3	7.5	7.2	15.5
New York, NY	9534	1883	20.7	19.9	9.3	7.2	4.3	16.6
Newark, NJ	1498	348	32.7	18.1	8.0	6.8	4.7	13.4
Newport News, VA	216	75	24.9	18.2	7.3	8.4	6.3	27.5
Orlando, FL	364	63	14.3	25.0	10.0	6.9	9.0	14.2
Paterson, NJ	1277	75	33.1	21.2	7.3	6.3	5.0	10.7
Philadelphia, PA	3951	843	30.8	20.0	7.2	7.0	5.2	14.4
Pittsburg, PA	2225	170	31.7	20.4	6.9	7.4	5.3	11.7
San Diego, CA	1257	62	17.5	21.9	9.5	9.5	6.6	21.6
San Francisco, CA	2583	330	16.7	20.8	9.2	8.0	5.4	19.4
Seattle, WA	1338	41	24.2	21.9	7.2	8.7	5.7	16.1
St. Louis, MO	1976	379	28.8	21.2	7.1	7.2	5.0	13.4
Tampa, FL	901	109	15.7	26.1	10.6	6.7	8.5	13.7
Trenton, NJ	253	50	27.7	15.5	8.6	10.7	5.3	21.6
Tulsa, OK	422	39	20.6	22.9	8.6	6.3	6.2	10.9
Washington, DC	2131	702	6.5	16.8	9.6	8.5	5.7	39.1
W. Palm Beach, FL	287	61	15.7	22.1	12.7	6.8	9.5	12.4
Youngstown, OH	484	51	42.9	19.5	5.3	5.9	4.9	10.0

Source: County and City Data Book, 1972

Note: Misc. Services include Business, Repair, and Personal Services