Black Populations and Economic Growth: An Extreme Bounds Analysis of Mississippi County-Level Data

Andrew T. Young*
Department of Economics
University of Mississippi
University, MS 38677
atyoung@olemiss.edu
Tel: 662-915-5829, Fax: 404-894-6030

Matthew J. Higgins
College of Management
Georgia Institute of Technology
Atlanta, GA 30308-0520
matt.higgins@mgt.gatech.edu
Tel: 404-894-4368. Fax: 404-894-6030

Daniel Levy
Department of Economics
Bar-Ilan University
Ramat-Gan 52900, Israel
levyda@mail.biu.ac.il
Tel: +972-3-531-8331, Fax: +972-3-535-3180

JEL Codes: J15, O40, O11, O18, R11

Key Words: racial inequalities, Black populations, Solow growth model, speed of convergence, U.S. county-level data, Extreme Bounds Analysis, regional studies

Last Revision: January 29th, 2007

* Corresponding Author: Andrew T. Young, Department of Economics, University of Mississippi, University, MS 38677, atyoung@olemiss.edu, Tel: 662-915-5829, Fax: 662-915-6943. The first author gratefully acknowledges a grant from the William Winter Institute at the University of Mississippi. All errors are ours.

Black Populations and Economic Growth: An Extreme Bounds Analysis of Mississippi County-Level Data

Abstract

We use Mississippi county-level data on (per capita) income and the percentages of populations that are Black (henceforth "Black") to examine the relationship between race and economic growth. The analysis is also conditioned on 40 other economic and socio-demographic variables. Given a negative and statistically significant partial correlation between income growth and Black, we ask if it is robust to exhaustive combinations of other conditioning variables (taken 3 at a time). The evidence suggests yes. Since even robust correlation does not imply causation, we then ask if other robust correlates with income growth play a roll in accounting for Black in the data. The answer “yes” is obtained for only one other robust correlate of the "right" sign: the percentage of a population that is below the poverty level.

I. Introduction

The state of Mississippi has the highest percentage of population that is Black of any state – about 37 percent as of 2004.[1] Furthermore, as of 2004 it was also the poorest state in the U.S. with (nominal) per capita income of $24,518. (The U.S. as a whole was about 12 percent Black and had a per capita income of $33,050.)

The coincidence of these two facts, unfortunately, is not likely to cause surprise. We have come to expect Black populations to be poor and for poor areas to have large Black populations. While the coincidence is not surprising the explanation(s) for it are unclear. This paper aims to evaluate the relationship between Black populations and (per capita income (henceforth simply "income") growth in Mississippi using county-level data within a neoclassical growth framework and an extreme bounds analysis (Leamer, (1983); Levine and Renelt (1992)).

Focusing on Mississippi separately is interesting because, first, it is the U.S. state where the coincidence of large Black populations and low incomes is most pronounced and, second, cultural and historical circumstances may be such that the relationships between race and income growth are heterogeneous, even across individual U.S. states.[2]

This paper builds on the work of Young et al. (2007a) who present evidence of a Mississippi conditional β-convergence rate of at least 4 percent.[3,4] (The upper bound of

[1] The U.S. Census Bureau categorization employed here is "Percent of the Total Population Who are Black or African American Alone". Data sources are described below.

[2] An unfortunate suggestion of this heterogeneity comes from the fact that from 1965 to 1970 the 10 largest net losses in terms of Black migration were represented by all Southern states (and Washington D.C.) with Mississippi at the top with a loss of 66,614 individuals. In contrast, from 1995 to 2000 the trend had reversed and 8 of the top 10 net *gains* in terms of Black migration were Southern states. Mississippi, however, is notably absent from those 8 and actually lost 2,691 individuals during that time period (Frey (2004, Table 1 and Appendix B)).

[3] There are two types of convergence: β-convergence and σ-convergence. When the partial correlation between growth in income over time and its initial level is negative, there is β-convergence. When the dispersion of real per capita income falls over time, there is σ-convergence.

the 95 percent confidence interval was over 19 percent!) This implies that counties close the gap between their present and balanced growth levels of income by at least 4 percent annually.

Still, Mississippi seems to have stalled in catching-up to the rest of the U.S. The ratio of Mississippi income to U.S. income in 1970 was 0.64; that same ratio in 1998 had only risen to 0.73. Worse yet, between 1998 and 2005 the ratio remained essentially constant at 0.73.[5]

Perhaps as disheartening, Young et al. (2007b) document that, from 1970 to 1998, there was statistically significant σ-*divergence* across Mississippi counties: the variance of county-level income levels *increased*. The U.S. state with the highest relative Black population seems poised to remain the poorest; and the relatively Black counties within Mississippi may also be falling behind their own-state counterparts.[6]

In this paper, we use county-level data from Mississippi on per capita income and the percentage of black population (henceforth "Black") to study the relationship between race and economic growth. In addition, we condition the analysis on 40 other economic and socio-demographic conditional variables. After finding a negative and statistically significant partial correlation between income growth and Black, we ask if it is robust to

---

[4] Nica (2004) also tests for β-convergence at the county-level in Mississippi. However, Nica only uses per capita income data and, therefore, only tests for *absolute* β-convergence. The maintained assumption in such a test is that the balanced growth paths are identical for all counties. Nica reports a convergence rate less than 1 percent. Young et al.'s (2007a) finding of at least a 4 percent rate when many economic/socio-demographic variables are conditioned on suggests that the maintained assumption of Nica (2004) is incorrect even across counties in a single U.S. state.

[5] Compare this to the performance of Massachusetts, a state with one of the higher per capita incomes and lower Black populations (3.1 percent in 1970; 6.0 percent in 2005). The ratio of Massachusetts to U.S. income was 1.11 in 1970, 1.21 in 1998, and continued to climb to 1.28 in 2005.

[6] This interpretation is supported by the findings of Young et al. (2007b) in combination with the robust partial correlation between per capita income growth and Black across Mississippi counties reported below. In contrast to the evidence on cross-county changes in income dispersion over time, Levernier et al. (1998) find that *within*-county family income inequality, for the single year 1990, was negatively related to the percentage of the population that is Black.

exhaustive combinations of other conditioning variables (taken 3 at a time). It turns out that the answer to this question is yes. Because even robust correlation does not imply causation (even in the absence of omitted variables), we then ask if other robust correlates with income growth play a roll in accounting for Black in the data. The answer is yes for only one other robust correlate of the "right" sign: the percentage of a population that is below the poverty level.

This paper is organized as follows. Section II outlines the basic empirical framework. Section III describes extreme bounds analysis, a method for determining whether certain variables are robust correlates with counties' income growth rates. Section IV then describes the Mississippi county-level data that will be used in the analysis. Section V reports the results of the extreme bounds analyses for Black and other variables. Section VI then asks whether any of these other robust correlates are plausibly causal factors underlying the negative partial correlation between Black and income growth. Some concluding discussion is offered in Section VII.

II. Econometric Framework

The neoclassical growth model implies that $\hat{y}(t) = \hat{y}(0)e^{-Bt} + \hat{y}^{*}(1-e^{-Bt})$, where $\hat{y}$ is log of income per effective unit of labor, t is the time period, and B is a nonlinear function of various parameters (population growth rate, preference parameters, etc.). B governs the speed of adjustment to the steady state while $\hat{y}^{*}$ denotes the steady state. Thus, the average growth rate of income per unit of labor between dates 0 and T is

$$\frac{1}{T}\big(y(T) - y(0)\big) = z + \left(\frac{1-e^{-BT}}{T}\right)\big(\hat{y}^{*} - \hat{y}(0)\big), \tag{2.1}$$

where z is the exogenous rate of technological progress and B measures the sensitivity of the average growth rate to the gap between the steady state and the initial value. Since effective unit of labor (L) is assumed to equal Le^{zt}, we have $\hat{y}(0) = y(0)$.

Growth regressions are obtained by fitting to the cross-sectional data the equation

$$g_n = \alpha + \beta_0 y_{n0} + \gamma' x_n + \nu_n, \tag{2.2}$$

where g_n is the average growth rate of per capita income for economy n between years 0 and T [i.e., $\left(y(T) - y(0)\right)/T$], α is a constant representing z, $\beta_0 = \left(1 - e^{-BT}\right)/T$, x_n is a vector of variables that control for cross-economy heterogeneity in determinants of the steady-state, $\hat{y}^*$, γ is a vector of coefficients, and ν_n is a zero mean-finite variance error. OLS can then be used to infer the values of β_0 and γ in (2.2) by regressing the growth rate on initial values of per capita income and other conditioning variables.

Income growth is related to the initial level of income via a β-convergence effect rooted in diminishing returns. As an economy approaches its balanced growth path via capital accumulation, *ceteris paribus* its income growth rate will decrease as returns to that accumulation diminish. However, convergence is conditional on the position of the balanced growth path. The x variables are meant to condition for determinants of the balanced growth path. Given any initial level of income, a higher (lower) balanced growth path implies a higher (lower) growth rate. As such, one reason that β-convergence need not imply σ-convergence (i.e., a decrease in the variance of income levels) is that balanced growth paths are divergent.

In this paper, when we analyze Black's relationship to income growth determination we are asking whether or not the position of counties' growth paths are correlated with the percent of their populations that are Black.

III. Extreme Bounds Analysis

A variant of Leamer's (1983) *extreme bounds analysis* (EBA), related to the approach of Levine and Renelt (1992), will be applied to our Mississippi county-level data based on cross-sectional growth regressions of the form,

$$g_i = \alpha + \beta_0 y_{i0} + \beta_1 x_{i1} + \sum_{j=1}^{J} \beta_j x_{ij} + \varepsilon_i , \tag{3.1}$$

which is an expansion of the form (2.2) where $i = 1, \ldots, 82$ are the Mississippi counties; g_i is the ith county's growth rate in per capita income from 1970 to 1998; y_{i0} is the initial (1970) level of per capita income; the x_{ij}s are J conditioning variables for each county and x_{i1} is, specifically, Black; α and the β_js are parameters; and the ε_is are county-specific disturbance terms.

We will consider a series of regressions where y_0 and x_1 are always included, but only selections of the $(J - 1)$ remaining xs are considered in each regression; these selections of xs will each number 3. Since there are 39 conditioning variables in our data (in addition to y_{i0} and x_{i1}; see **Table 1**), this implies a possible ${}^{38}C_3 = 9{,}139$ regressions.

From these 9,139 regressions, the highest coefficient estimate on Black that is statistically significant at the 5 percent level or lower is recorded plus 2 standard errors. This number is the *extreme upper bound*. As well, the lowest coefficient estimate on Black that is statistically significant is recorded minus 2 standard errors. This number is the *extreme lower bound*. If these extreme bounds are both of the same sign (i.e., positive or negative) then we regard Black as a *robust* correlate with income growth in

Mississippi; if the extreme bounds are of different signs than we regard Black as a *fragile* correlate.[7]

The intuition of EBA is that, given many potential correlates with income growth and a limited number of cross-sectional observations (82 counties), any single regression is necessarily misspecified. Omitted variable biases cast doubt on the coefficient on Black from any given regression. As well, collinearity among variables that *are* included in a given regression may inflate the coefficient estimate's standard errors, leading to acceptance of a null of a zero partial correlation. However, if over a large number of potential regressions, statistically significant coefficients estimates on Black are produced *and* all of those estimates are of the same sign, then this supports a robust partial correlation.

We also perform EBAs for each of our other conditioning variables. In Higgins et al. (2006) the full U.S. sample consists of 3,058 counties so we enjoyed the luxury of simply including all of our variables in the regression. In the present paper we consider each variable as a potential correlate with Mississippi county-level income growth. If any are determined to the robust correlates, then these variables can also be considered later as potentially causal factors underlying a robust negative correlation between Black and county-level income growth.

IV. U.S. County-Level Data

The data we use are drawn from several sources but the majority comes from the Bureau of Economic Analysis Regional Economic Information System (BEA-REIS) and

[7] If no statistically significant coefficients arise from the 9,139 regressions, then we simply regard Black as not being a correlate with county-level growth.

U.S. Census data sets. The BEA-REIS data are largely based on the 1970, 1980 and 1990 decennial Census files; the 1972, 1977, 1982 and 1987 Census of Governments; and the Census Bureau's City and County Book from various years. We exclude military personnel from the measurements of both personal income and population.

We use the BEA's measure of personal income which, along with county population, allows for computation of per capita income. We adjust it to be net of government transfers and express it in 1992 dollars. Natural logs of real per capita income are used throughout.

Our data contain observations for the 82 counties of Mississippi. In addition to initial income, we utilize 40 demographic conditioning variables, listed in **Table 1**, including the percentage of a county's population that is Black. These variables include measures of levels of educational attainment; government employment at federal, state and local levels; the percentage of the population below the poverty line; and employment shares of various industries.

V. Results of Extreme Bounds Analyses

Table 2 reports the variables for which extreme bounds can be determined. In each of these cases it turns out that the extreme bounds are of the same sign. Therefore, based on our data, **Table 2** lists 15 robust correlates with Mississippi income growth at the county-level.

Of primary interest, Black is a robust and negative correlate with income growth at the county-level in Mississippi. *Ceteris paribus* if the percentage of a county's population that is Black increases by 1 percent then this correlates with between a 0.0001 and 0.0180 percent decrease in the county's income growth rate. This is a wide range and

covers very small absolute values at one extreme. To give some additional perspective, the standard deviation of Black across Mississippi counties in 1970 was 17.96 percent. (See **Table 3** for summary statistics on Black.) A one standard deviation increase in Black correlates with between a 0.0018 and 0.3233 percent decrease in income growth.

Of interest, in Higgins et al. (2006) (based on the full U.S. sample of 3,058 observations) we include all 39 additional variables in each regression and Black is either not a statistically significant correlate or, in the case of a metro county subsample, actually a positive correlate.[8] As well, in Young et al. (2007a) we run a regression with the county-level data for each U.S. state individually and include all conditioning variables. Depending on the state, Black was sometimes significant and negative, sometimes significant and positive, but most often not significant (e.g., the Mississippi case).[9] With the inclusion of all 39 conditioning variables, this is likely a result of limited degrees of freedom.

A great deal of heterogeneity and uncertainty obscure the role of this variable in income growth determination but, using the EBA, we find Black to be a robust, negative correlate with Mississippi income growth at the county-level.

VI. Plausible Underlying Factors?

Despite Black being a robust negative correlate, other variables in our data set may still be true causal factors and Black correlation is via its correlation with those causal factors. Of course, the robust nature of Blacks negative correlation with income

[8] Percentage of the population that is Black was not a variable reported on in Higgins, et al. (2006). However, full results, including for the Black variable, are included in an unpublished appendix available from the authors upon request.

[9] Again, these results are not included in Young, et al. (2007a) but rather in an unpublished appendix available from the authors upon request.

growth lends credence to the view that it is a causal factor itself, or that there are causal factors omitted from the analysis that correlate with Black (e.g., the prevalence of institutional racism). However, if causal factors are included in the regressions and correlate with Black, this introduces collinearity. Collinearity inflates standard errors but not necessarily to an extent rendering a given coefficient statistically insignificant. Furthermore, EBA only focuses on statistically significant estimates and actually ignores the fact that in many regressions the coefficient on Black is not statistically significant.

In this section, therefore, we explore to what extent the other identified robust correlates can account for the percentage of a county's population that is Black. We regress the variable Black on a constant and each of the other robust correlates. The results are presented in **Table 4**.

There are seven variables that are significant at the 10 percent level or better and the R^2 for the regression is 0.8673. Furthermore, five of these seven variables have partial correlations with Black of the opposite sign of their correlation with economic growth. These represent plausible causal factors underlying the negative correlation between Black and income growth: Education: Bachelor +; Education: 9-11; Entertainment and Recreational Services; Poverty; and State Government.

Concerning these five variables, the partial correlations with Black are sometimes surprising. For example, the percent of a county's population with a bachelor degree or more is *positively* correlated with Black; and the percent of a county's population with only 9 to 11 years of education is *negatively* correlated with Black. This suggests that, in Mississippi, counties with larger Black populations also have more educated populations. Furthermore, the correlations of these educational attainment variables with income growth have counter-intuitive signs. If they are causal factors then the conclusion is that

Black populations are associated with less income growth *because of their relatively high levels of educational attainment!*

On the other hand, the poverty rate is positively correlated with Black (and significant at the 1 percent level) and is a robust negative correlate with growth. This would represent a more intuitively sensible causal link: poverty traps. Black populations tend to have relatively high poverty rates and poverty is a condition that leads to economic stagnation because, e.g., little disposable income is available for saving.

VII. Conclusions

Despite the poverty trap story offered above in Section VI, one can not lose sight of the fact that the percentage of a county's population that is Black is a robust, negative correlate with Mississippi income growth. In other words, while controlling for a large set of economic and socio-demographic factors considered in numerous combinations, it is exceedingly difficult to dismiss the link between the variable Black itself and income growth.

This finding contrasts with evidence offered by, e.g., Higgins et al. (2006), Glaeser et al. (1995) and Connaughton and Madsen (2004) for the U.S. as a whole.[10] It is a frustrating finding in two ways: first, because it suggests that Mississippi represents a unique (and unfortunate) case and, second, because it presently leaves the discussion at the dead end of unobservable omitted variables.

Depending on which unobservable omitted variables are suggested and/or favored, they may represent very different policy implications. For example, the robust,

[10] An early study using county-level data by Carlino and Mills (1987) found that the 1970 Black values were significantly associated with increased manufacturing employment.

negative correlation associated with Black may indicate the existence of institutional racism and the need for appropriate policies to combat it. On the other hand, it may indicate cultural traits that are not conducive to growth; appropriate policy may include disincentives to such traits.

The findings reported above, therefore, call for detailed examination of conditions associated with Black populations in Mississippi. This is not an entirely negative conclusion. The findings specifically call for an examination beyond the "usual suspects" of, e.g., educational attainment, extent of the public sector, and the prevalence of certain industries.

References

Barro, R. J. and Sala-i-Martin, X. X. 1992. Convergence. *Journal of Political Economy* 100, 223–251.

Barro, R. J. and Sala-i-Martin, X. X. 1995. *Economic Growth*. MIT Press, Cambridge.

Carlino, G. A. and Mills, E. S. 1987. The Determinants of County Growth. *Journal of Regional Science* 27, 39-54.

Connaughton, J. E. and Madsen, R. A. 2004. Explaining Per Capita Personal Income Differences between States. *Review of Regional Studies* 34, 206-220.

Evans, P. 1996. Using Cross-Country Variances to Evaluate Growth Theories. *Journal of Economic Dynamics and Control* 20, 1027–1049.

Evans, P. 1997a. How Fast Do Economies Converge? *Review of Economics and Statistics* 36, 219–225.

Evans, P. 1997b. Consistent Estimation of Growth Regressions. Working Paper, Ohio State University.

Evans, P. and Karras, G. 1996a. Do Economies Converge? Evidence from a Panel of US States. *Review of Economics and Statistics* 78, 384–388.

Evans, P. and Karras, G. 1996b. Convergence Revisited. *Journal of Monetary Economics* 37, 249–265.

Frey, W. H. 2000. The New Great Migration: Black Americans' Return to the South, 1965-2000. The Brookings Institute, Center on Urban and Metropolitan Policy, Living Cities Census Series.

Glaeser, E. I., Scheinkman, J. A. and Shleifer, A. 1995. Economic Growth in a Cross-Section of Cities. *Journal of Monetary Economics* 36, 117-143.

Higgins, M. J., Levy, D., and Young, A. T. 2006. Growth and Convergence Across the

United States: Evidence from County-Level Data. *Review of Economics and Statistics* 88, 671-681.

Leamer, E. 1983. Let's Take the Con out of Econometrics. *American Economic Review* 73, 31-43.

Levernier, W., Partridge, M.D. and Rickman, D.S. 1998. Differences in Metropolitan and Nonmetropolitan U.S. Family Income Inequality: A Cross-County Comparison. *Journal of Urban Economics* 44, 272-290.

Levine, R. and Renelt, D. 1992. A Sensitivity Analysis of Cross-Country Growth Regressions. *American Economic Review* 82, 942–963.

Mankiw, N.G., Romer, D.H. and Weil, D.N. 1992. A Contribution to the Empirics of Economic Growth. *Quarterly Journal of Economics* 107, 407–437.

Nica, M. 2004. Convergence in Mississippi: A Spatial Approach. Jackson State University Working Paper.

U.S. Bureau of Economic Analysis. 2001. *Local-Area Personal Income, 1969–1992*. Regional Accounts Data.

Young, A.T., Levy, D., and Higgins, M. J. 2007. Heterogeneous Convergence, working paper.

Young, A.T., Higgins, M. J., and Levy D. 2007. Sigma Convergence versus Beta Convergence: Evidence from U.S. County-Level Data, working paper.

TABLE 1.—VARIABLE DEFINITIONS AND THEIR SOURCES

Variable	Definition	Period	Source
Income	Real Per Capita Personal Income (excluding transfer payments)	1969–1998	BEA
Land area per capita	Land area in km^2/population	1970-1990	Census
Water area per capita	Water area in km^2/population	1970-1990	Census
Age: 5-13 years	Percent of 5–13 year olds in the population	1970-1990	Census
Age: 14-17 years	Percent of 14–17 year olds in the population	1970-1990	Census
Age: 18-64 years	Percent of 18–64 year olds in the population	1970-1990	Census
Age: 65+	Percent of 65+ olds	1970-1990	Census
Black	Percent of Blacks	1970-1990	Census
Hispanic	Percent of Hispanics	1970-1990	Census
Education: 9-11 years	Percent of population with 11 years education or less	1970-1990	Census
Education: H.S. diploma	Percent of population with high school diploma	1970-1990	Census
Education: Some college	Percent of population with some college education	1970-1990	Census
Education: Bachelor +	Percent of population with bachelor degree or above	1970-1990	Census
Education: Public elementary	Number of students enrolled in public elementary schools	1970-1990	Census
Education: Public nursery	Number of students enrolled in public nurseries	1970-1990	Census
Education: Private elementary	Number of students enrolled in private elementary schools	1970-1990	Census
Education: Private nursery	Number of students enrolled in private nurseries	1970-1990	Census
Housing	Median house value	1970-1990	Census
Poverty	Percent of the population below the poverty line	1970-1990	Census
Federal government employment	Percent of population employed by the federal government in the county	1969-1998	BEA
State government employment	Percent of population employed by the state government in the county	1969-1998	BEA
Local government employment	Percent of population employed by the local government in the county	1969-1998	BEA
Self-employment	Percent of population self-employed	1970-1990	Census
Agriculture	Percent of population employed in agriculture	1970-1990	Census
Communications	Percent of population employed in communications	1970-1990	Census
Construction	Percent of population employed in construction	1970-1990	Census
Entertainment & recreational services	Percent of population employed in entertainment & recreational services	1970-1990	Census
Finance, insurance & real estate	Percent of population employed in finance, insurance, and real estate	1970-1990	Census
Manufacturing: durables	Percent of population employed in Manufacturing of durables	1970-1990	Census
Manufacturing: non-durables	Percent of population employed in manufacturing of non-durables	1970-1990	Census
Mining	Percent of population employed in mining	1970-1990	Census
Retail	Percent of population employed in retail trade	1970-1990	Census
Transportation	Percent of the population employed in transportation	1970-1990	Census
Business & repair services	Percent of population employed in business and repair services	1970-1990	Census
Educational services	Percent of population employed in education services	1970-1990	Census
Professional and related services	Percent of population employed in professional services	1970-1990	Census
Health services	Percent of population employed in health services	1970-1990	Census
Personal services	Percent of population employed in personal services	1970-1990	Census
Wholesale trade	Percent of population employed in wholesale trade	1970-1990	Census
College town	Dummy Variable: 1 if the county had a college or university enrollment to population ratio greater than or equal to 5% and 0 otherwise.	1970	National Center for Educational Statistics
Metro area	Dummy Variable: 1 if the county was in a metro area in 1970, and 0 otherwise	1970	Census

Notes: All BEA variables are available annually from 1969 to 1998. All Census variables are gathered from the 1970, 1980 & 1990 Census tapes. Values for 1969 were obtained via the interpolation method as discussed in the data section.

TABLE 2.—EXTREME BOUNDS (WHEN THEY EXIST) FOR POTENTIAL CORRELATES WITH MISSISSIPPI ECONOMIC GROWTH

Variables	Extreme Lower Bound	3 Variables in Lower Bound Regression	Extreme Upper Bound	3 Variables in Upper Bound Regression
Black	-0.0180	Manufacturing: non-durables Health services Wholesale trade	-0.0001	Land area per capita Entertainment & recreational services Wholesale trade
Land area per capita	0.0000	Education: 9-11 years Local government employment Entertainment & recreational services	0.0000	Education: Public nursery Housing Entertainment & recreational services
Housing	-0.0000	Water area per capita Land area per capita Finance, insurance & real estate	-0.0000	Self-employment Finance, insurance & real estate Entertainment & recreational services
Education: 9-11 years	0.0002	Land area per capita Finance, insurance & real estate Transportation	0.0932	Age: 5-13 years Local government employment Entertainment & recreational services
Education: Bachelor +	-0.1643	State government employment Finance, insurance & real estate Health services	-0.0007	Metro area Finance, insurance & real estate College town
Poverty	-0.0466	Wholesale trade Entertainment & recreational services Manufacturing: non-durables	-0.0004	Wholesale trade Entertainment & recreational services Black
State government employment	0.0006	Education: Bachelor + Finance, insurance & real estate Health services	0.1010	Professional related services Entertainment & recreational services Wholesale trade
Local government employment	-0.1469	Agriculture Manufacturing: non-durables Entertainment & recreational services	-0.0003	Education: 9-11 years Metro area Entertainment & recreational services

Notes: Extreme lower (upper) bound is the lowest (highest) statistically significant coefficient at the 5 percent level coefficient estimate minus (plus) 2 standard errors. Analysis for each variable involves 9,139 regressions where average Income growth from 1970 through 1998 is the dependent variable and 1970 Income and variable of interest are always included with combinations of 3 of the remaining 39 potential conditioning variables. The estimation method is ordinary least squares.

TABLE 2 (CONT.).—EXTREME BOUNDS (WHEN THEY EXIST) FOR POTENTIAL CORRELATES WITH MISSISSIPPI ECONOMIC GROWTH

Variables	Extreme Lower Bound	3 Variables in Lower Bound Regression	Extreme Upper Bound	3 Variables in Upper Bound Regression
Finance, insurance & real estate	0.0009	Local government employment Education: 9-11 years Entertainment & recreational services	0.5451	Communications Education: Private nursery Manufacturing: durables
Manufacturing: non-durables	-0.0368	Local government employment Black Wholesale trade	-0.0002	Local government employment Black Wholesale trade
Manufacturing: durables	0.0001	Finance, insurance & real estate Water area per capita Entertainment & recreational services	0.0356	State government employment Entertainment & recreational services Wholesale trade
Educational services	-0.0989	State government employment Health services Entertainment & recreational services	-0.0001	Manufacturing: durables State government employment Entertainment & recreational services
Entertainment & recreational services	0.0057	Manufacturing: non-durables Local government employment Wholesale trade	1.3387	Personal services Hispanic Land area per capita
Professional and related services	-0.0880	Finance, insurance & real estate State government employment Entertainment & recreational services	-0.0004	Finance, insurance & real estate State government employment Wholesale trade
Wholesale trade	0.0014	Entertainment & recreational services Education: 9-11 years Land area per capita	0.2563	Health services Manufacturing: non-durables Black

Notes: Extreme lower (upper) bound is the lowest (highest) statistically significant coefficient at the 5 percent level coefficient estimate minus (plus) 2 standard errors. Analysis for each variable involves 9,139 regressions where average Income growth from 1970 through 1998 is the dependent variable and 1970 Income and variable of interest are always included with combinations of 3 of the remaining 39 potential conditioning variables. The estimation method is ordinary least squares.

TABLE 3.—SUMMARY STATISTICS FOR 1970 AND 2000 PERCENTS OF MISSISSIPPI COUNTIES' POPULATIONS THAT ARE BLACK

Year	Statistic	Value
1970	Mean	0.3870
	Standard Deviation	0.1796
	Maximum (Jefferson County)	0.7527
	Minimum (Tishomingo County)	0.0448
2000	Mean	0.3967
	Standard Deviation	0.2015
	Maximum (Jefferson County)	0.8649
	Minimum (Tishomingo County)	0.0311

Note: Based on 1970 and 2000 US Census values for 82 Mississippi counties.

TABLE 4.—RESULTS OF REGRESSING PERCENT OF THE POPULATION THAT IS BLACK ON OTHER ROBUST CORRELATES WITH INCOME GROWTH AT THE COUNTY-LEVEL FOR MISSISSIPPI

Variable	Point Estimate (Standard Error)
Finance, Insurance and Real Estate	1.5926
	(1.7536)
Manufacturing: Nondurable	-0.3380***
	(0.1778)
Manufacturing: Durable	-0.1148
	(0.1612)
Educational Services	-0.0767
	(0.6578)
Entertainment and Recreational Services	-9.3806**
	(4.0030)
Professional and Related Services	0.6988
	(0.6359)
Wholesale Trade	1.2641
	(0.8194)
Land Area	0.0000
	(0.0000)
Housing	-0.0000
	(0.0000)
Education: 9-11	-0.9311**
	(0.3591)
Education: Bachelor +	1.6508**
	(0.8035)
Poverty	1.3221*
	(0.1388)
State Government	-1.4977*
	(0.4984)
Local Government	-1.3481**
	(0.5979)

Notes: Based on 1970 US Census values for 82 Mississippi counties. Dependent variable is Black. *, **, and *** denote statistical significance at the 1 percent, 5 percent level, and 10 percent level, respectively. Shaded rows indicate variables whose correlations with income and Black are of opposite signs.