NEA RESEARCH
WORKING PAPER

April 2004

The Effects of State Public K–12 Education Expenditures On Income Distribution

NATIONAL EDUCATION ASSOCIATION
nea.org
Great Public Schools for Every Child

NEA RESEARCH
WORKING PAPER

April 2004

The Effects of State Public K–12 Education Expenditures on Income Distribution

Todd Behr, Constantinos Christofides, and
Pattabiraman Neelakantan
East Stroudsburg University

nea
NATIONAL EDUCATION ASSOCIATION
www.nea.org
Great Public Schools for Every Child

The National Education Association is the nation's largest professional employee organization, representing 2.7 million elementary and secondary teachers, higher education faculty, education support professionals, school administrators, retired educators, and students preparing to become teachers.

Complimentary copies of this publication are available in limited numbers from NEA Research for NEA state and local associations and UniServ staff. Call 202-822-7400. Additional copies may be purchased from the NEA Professional Library, Distribution Center, P.O. Box 2035, Annapolis Junction, MD 20701-2035. Telephone 800-229-4200 for price information. This publication may also be downloaded from www.nea.org.

This project was funded by a grant from the National Education Association.

Published April 2004

Contents

Figures

Executive Summary

The effects of education on people's income are well documented in the economics literature, and the benefits of investing in human capital—in terms of both higher earnings and of other economic and social benefits—are popular research topics for economists and other social scientists. The present study explores the effects of public education expenditures on the distribution of income among people living in the 50 states and the District of Columbia. The study's basic premise is that, since a state's income level depends on its residents' educational level then the income distribution within each state is dependent on the distribution of educational levels among its residents. (There are, of course, other factors contributing to income level dispersion within a state, and these variables' effects are also considered.)

One popular way of graphically depicting equality of income distribution is the Lorenz curve, which records the percentage of total income received by a certain percentage of the population. For a state with perfect equality of income distribution the Lorenz curve appears as a 45-degree line, since 10 percent of the state's population receives 10 percent of the income, 20 percent receives 20 percent, and so on. No state, of course, has perfect equality of income distribution, so this depiction enables researchers to illustrate the relative *degree* of a state's equality of income distribution. In other words, the closer a state's Lorenz curve comes to the perfect 45-degree line the more equal the income distribution among its residents. Thus, the area between the Lorenz curve and the 45-degree line illustrates a state's relative degree of income distribution equality. The smaller the area is the greater a state's equality of income distribution, and the larger the area is the greater a state's inequality of income distribution.

When this gap is expressed as a percentage of the total area, it provides a convenient numerical measure of income distribution equality known as the Gini coefficient. A Gini coefficient of zero indicates perfect equality while a Gini coefficient of one indicates perfect inequality (one person receives the entire income). Kevin Sylwester (2002a) used the Gini coefficient to measure degrees of income distribution equality among fifty countries, and found that countries devoting more resources to public education experienced greater income distribution equality in subsequent years. The current study uses the Gini coefficient to measure degrees of income distribution equality among the fifty United States and the District of Columbia, and measures the impact of devoting more resources to public education on those degrees of income distribution equality in subsequent years.

This report's chapters are Income and Poverty Trends and Distribution, Methodology, Empirical Results, and Conclusions. There are two appendixes of summary and supporting tables and a bibliography that combines both referenced and non-referenced citations. The Trends and Distribution chapter discusses income distributions across the fifty states and the District of Columbia and compares other statistical characteristics, such as differences in public education spending. National trends in income equality from 1970 to 2000 are discussed, as well as trends in other state socioeconomic variables.

The effects of public education expenditures by a state on its Gini coefficient are discussed in the Methodology

chapter (they are actually calculated and reported in the Empirical Results chapter), which introduces the basic model and discusses the selection of both dependent and independent variables and the mathematical structure of the regression equations. References are made to other relevant studies, and the similarities of the model to other models are explained. The different measures of income distribution equality are discussed, and the various measures among the states are explained in detail. Since other factors contribute to equality of income distribution besides education, the Methodology chapter identifies them and explains how their effects are "netted out." This chapter briefly surveys the literature, listing other research studies that have addressed the relationship between education and equality of income distribution. (A comprehensive Bibliography appears at the report's end.)

The next chapter discusses empirical results. Since the project's primary purpose was to measure the effects of education expenditures on state income dispersion, this chapter reports exactly how the Gini coefficients of the fifty states and the District of Columbia are influenced by their public education spending levels. The effects of education on lower income residents and on overall poverty levels have been measured and are reported. (Summary tables appear in Appendix A to enable the reader to more conveniently focus on them without having to interpret the supporting estimated regression equations, which appear in Appendix B.)

The report's Conclusions chapter provides a summary of the study's empirical results and critically evaluates how they correspond to the researchers' original expectations. A series of reflections on the other effects of education expenditures and other goals that the project has achieved are also enumerated.

1

Income and Poverty Trends and Distribution

The Gini coefficients, income data, and poverty rates used in this report were collected from the United States Census Bureau. All of these measures were based on reported pre-tax income that recipients received from a variety of sources. The data do not include non-cash benefits, such as food stamps and health benefits, and they do not include capital gains and losses.

In 1993, the Census Bureau began using a new data collection procedure that more accurately measures higher income values of survey respondents. Since this change was more likely to increase reported income at higher income levels, it imparted an upward shift in measured income inequality, although reported median income was only slightly affected, if at all. This means that pre-1993 and post-1992 Gini coefficients and income shares may not be comparable (Jones and Weinberg 2000). However, since our statistical estimations rely only on the Gini values for the year 2000, our findings should not be affected by the change in Census methodology.

The Gini Coefficient

Income inequality as measured by the Gini coefficient has increased since 1967. As FIGURE 1 shows, the increase has

FIGURE 1 Household Gini Coefficients, by Year

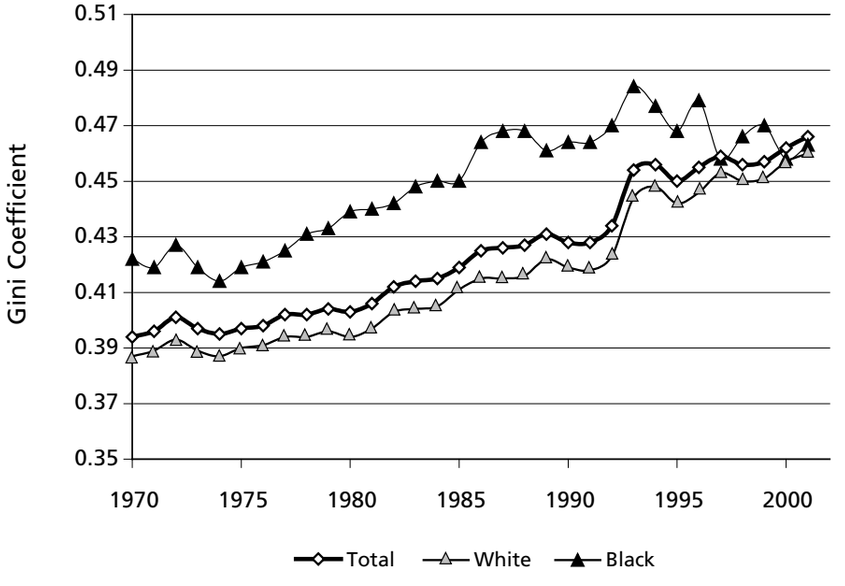


TABLE 1 Shares of Aggregate Income Received by Each Fifth (all races)

Year	Q1 Lowest	Q2	Q3	Q4	Q5 Highest	Q5/Q1
2000	3.6	8.9	14.8	23.0	49.8	13.8
1990	3.9	9.6	15.9	24.0	46.6	11.9
1980	4.3	10.3	16.9	24.9	43.7	10.2
1970	4.1	10.8	17.4	24.5	43.3	10.6

occurred for both whites and blacks. (The Census Bureau defines a household as consisting of both family and nonfamily members occupying a distinct housing unit.) FIGURE 1 depicts household Gini coefficients by year (see also TABLE A.1, page 14).

Because the national trend for the Gini coefficient masks important differences across states, TABLE A.2 (page 15) presents data on the Gini coefficient across states. Note that the coefficient ranged from a low of .402 for Alaska to a high of .549 for the District of Columbia. In addition, although the Gini coefficient increased for every state between 1980 and 2000, the increase was most pronounced in Connecticut (a 22.3% increase) and least pronounced in Alaska (a 2.3% increase).

Income Shares

By condensing the income distribution into a single measure the Gini coefficient misses important data distinctions across income groups. Consequently, we also considered the income shares going to each quintile. As TABLE 1 (above) shows, the income shares of the highest income groups have increased during the last three decades, while the shares going to each of the lower income classes have decreased.

TABLE A.3 (page 17) shows the ratio of income going to the highest quintile relative to the lowest quintile for each state in the year 2000. The data indicate that, like the Gini data, Alaska and Utah have the most equally distributed income while the District of Columbia and New York have the least equally distributed income.

FIGURE 2 Individual Poverty Rates

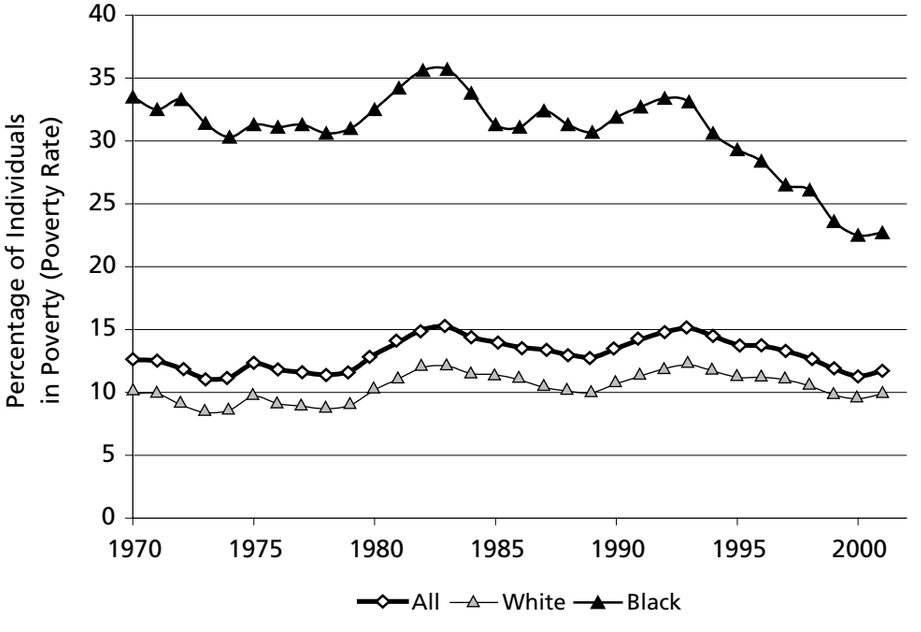
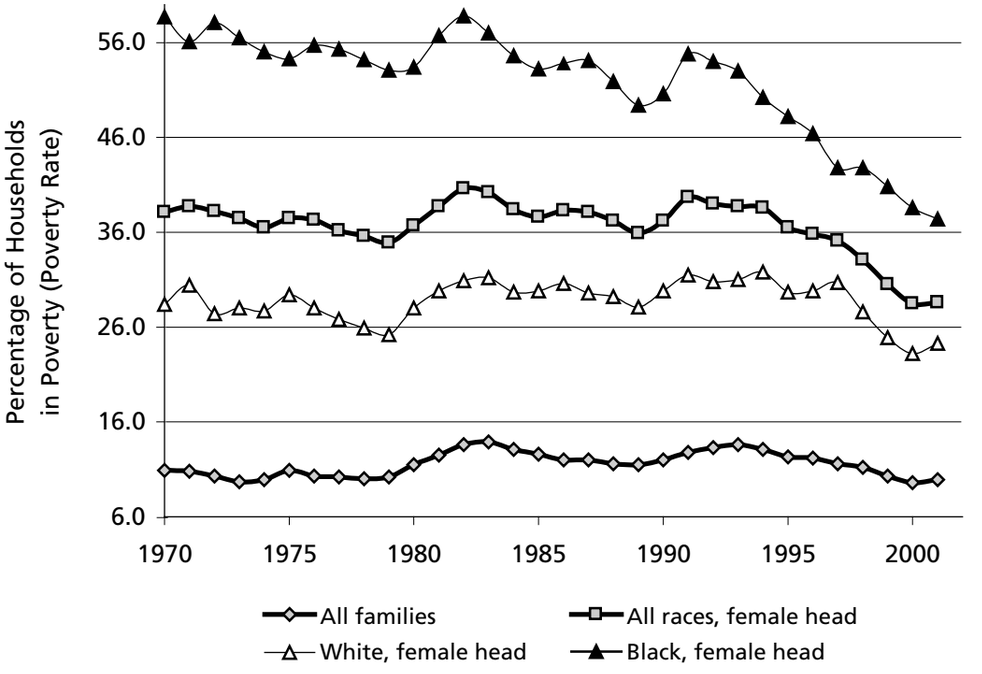


FIGURE 3 Household Poverty Rates



Poverty Rates

Since we believe education can reduce income inequality by improving opportunities for—and, as a result, the economic well being of—the poor, we also examined poverty rates. The Census Bureau calculates annual poverty thresholds based on different family sizes, and adjusts the thresholds each year to account for cost of living changes.

Note in FIGURE 2 that the respective poverty rates for whites and blacks were lower in 2001 than in 1970, although the rate for blacks was still considerably higher than for whites.

One can see in FIGURE 3 that poverty rates are consistently high for households headed by females with no husband present.

TABLE A.6 (page 21) shows the distribution of poverty rates across the states for 1970, 1980, 1990, and 2000. Poverty rates fell for most states during this period, with the largest percentage decreases occurring in Mississippi (a 58% decrease) and South Carolina (a 54% decrease).

2

Methodology

The model used in this paper parallels other models, such as the one Sylwester (2002a) developed to evaluate the effects of public education expenditures on the income distribution of fifty different nations and the one De Gregorio and Lee developed (2002) to investigate the education and income inequality relationship by analyzing statistical evidence from a cross-country data set. These and other studies—such as Becker and Chiswick (1966) and Schultz, Becker, and Mincer (1963)—suggest that the inequality of income stems from the level and distribution of education across the population. Bernat (2001) investigated and documented income inequality among states, but his was primarily a statistical study with no attempt made to link state income dispersion to education.

The uniqueness of the current study is that it attempts to relate the income distribution within each state to variations in educational levels, age distribution, social, economic, occupational, and industrial opportunities, and population density. (Data for all these variables are discussed in the Empirical Results chapter.) The underlying assumption is that the public education expenditures of the various states contribute to a reduction in educational inequality and therefore a decrease in income inequality. Most studies agree that the effects of public education expenditures are cumulative and do not actually materialize until several years later. It is because of this that education expenditures per student are lagged and summed from five to twenty-five years. For example, the income inequality of the various states in the year 2000 is influenced by public education expenditures during the years 1970–1995, thus the cumulative expenditures during those twenty-five years are expected to exert an impact on state income inequality during the year 2000. Another reason for including the sum rather than individual years' spending is to smooth out annual fluctuations in state education expenditures. Finally, the sum of annual expenditures on public education is a better reflection of the impact of such spending on the stock of human capital.

In general, the basic equation of the model expresses state income inequality as a function of educational levels, age distribution, social dispersion, occupational dispersion, and lagged cumulative public education expenditures per pupil.

The most common measure of income inequality is the Gini coefficient and, in fact, the Gini was chosen as the initial dependent variable. Public education expenditures are expected to reduce the Gini coefficients by contributing to an increase in lower incomes and, thus, a decrease in income inequality from the bottom up. To further explore this hypothesis a second stage of the model specifies the mean income of the lower quintile of each state as the dependent variable. In a third stage, to further substantiate the robustness of the first two stages, the level of poverty for each state was defined as the dependent variable. In all three stages the results were consistent: the effects of public education expenditures were statistically significant and they did indeed seem to decrease income inequality across the states.

As explained above, the Gini coefficient is a measure of relative income inequality ranging from zero to one,

where zero designates perfect equality of distribution and one perfect inequality. No state, of course, has perfect income equality or inequality, but the Gini coefficients for the various states ranged from highs of 0.549 and 0.499 for the District of Columbia and New York to lows of 0.410 and 0.402 for Utah and Alaska in 2000. The effects of public education expenditures on the Gini coefficient were evaluated using the following multiple regression equation:

$$G_{2000} = a_0 + a_1 E_{70-95} + a_2 AGE + a_3 SD + a_4 ED + a_5 OD$$

Where:

G_{2000} is the Gini coefficient of states in the year 2000.

E_{70-95} is the total state public education expenditure per pupil from 1970–1995.

AGE is the age distribution in each state measured as the percentage of the population 18–24, the percentage of the population 25–44, and the percentage of the population 45–64.

SD, representing social dispersion, is the percentage of households in each state with a female head of household, no husband, and children under 18.

ED, the ratio of state residents with Bachelor's degrees to those without a high school degree, is used as an indicator of educational dispersion within each state.

OD, the percentage of each state's population employed in manufacturing and the percentage employed in service industries, is used to indicate occupational dispersion.

Similar equations were used to estimate the effects of all the above explanatory variables on:

- The mean income, lowest quintile in each state.
- The mean income, second lowest quintile in each state.
- The ratio of the highest quintile mean to the lowest quintile mean.
- The percentage of state residents below the poverty level.

The above equations were estimated using cross section and time series statistics for the fifty states and the District of Columbia from 1970 through 2000. Education expenditures were expressed in constant dollars and all other variables were expressed as percentages. The coefficients of the equations were estimated using the latest version of Minitab, and the results are discussed in the report's Empirical Results chapter as well as conveniently arranged in summary tables in Appendix A.

In conclusion, the model used four different measures of income inequality: the Gini coefficient, lowest income, second to lowest income, and poverty rates. All these alternative measures of income inequality were then explained by using various independent variables such as: public education expenditures, age dispersion, social dispersion, occupational dispersion, and population dispersion within states. The model's main emphasis was to determine whether public education expenditures by states contribute to a decrease in income inequality. Recognizing that other factors do influence income distribution, it was important that the effects of these other factors were recognized and accounted for.

3

Empirical Results

Effects of Education on the Gini Coefficient

When the Gini coefficient was used as the dependent variable in the first equation, the sum of public education expenditures variables had a negative and statistically significant coefficient. This means that, when a state spends more money on public education it eventually decreases its income inequality. This result remained robust even when some of the less significant variables were removed and the regression equation was re-estimated. The negative coefficient of the public education expenditures remained negative and significant, as indicated in TABLE B.1 (page 26). This result seems to be consistent with the original expectation of the model that an increase in education expenditures contributes to greater educational equality and therefore greater income equality. This result is also consistent with the De Gregorio and Lee finding that "higher educational attainment and more equal distribution of education play a significant role in making income distribution more equal."

To correct for the influence of income on income distribution, the first equation contained state per capita personal income in logarithmic form and also the square of the log of income. This approach has been used by other studies in order to determine the relationship between income level and income inequality. The results show that states with higher incomes also have greater income equality, but eventually, as incomes continue to increase, the degree of income inequality begins to increase.

The remaining estimated coefficients appear to meet the expectations of the model:

- A decrease in educational dispersion leads to a decrease in income inequality.
- A decrease in social dispersion leads to a decrease in income inequality.
- A decrease in occupational dispersion leads to a decrease in income inequality.

The only variable that did not seem to have a significant impact on income inequality was age distribution. The ratio of younger to older workers was used as a reflection of the age distribution in each state. The greater the ratio the more equal the distribution of income. The coefficient of this variable did indeed have the correct algebraic sign—negative—indicating that as the ratio increases the Gini coefficient decreases, but the coefficient was not significant at the 95 percent level.

Education dispersion was approximated by the ratio of college graduates to those without a high school degree, and the assumption is that an increase in public education expenditures should increase that ratio by increasing the numerator and decreasing the denominator. In other words, as states spend more money on public education they contribute to both an increase in the number of high school graduates and they improve the chances for college bound high school graduates to continue their education. As mentioned above, the regression coefficient of this variable was negative and significant, meaning that reducing education inequality contributes to reducing income inequality.

The degree of social dispersion within each state may be approximated using different factors, such as unemployment rates, demographic characteristics, gender, race, and other diversity variables. The one variable that seemed

to be most significant in influencing income inequality was the percentage of households within each state headed by females with no husband and with children under 18. As the number of such households increased the Gini coefficient of states also increased, meaning greater inequality of income. Other social dispersion variables did not prove significant.

Occupational dispersion among different industries was measured by the percentage of state residents who are employed in manufacturing and the percentage employed in service industries. Both variables proved significant in reducing income inequality. This implies that states with larger manufacturing and service sectors provide more occupational opportunities, and income in these states is more equally distributed.

Effects of Education on Lower Incomes

The positive effects of public education expenditures on income inequality may be interpreted in terms of greater contributions to lower incomes than to higher incomes. To further explore the relationship between education expenditures and lower incomes, a number of second stage equations were estimated whose dependent variables were the mean income of the lowest quintile in each state, the second lowest, the third, and so on. The independent variables of these equations were the same as the Gini equations described above. The estimation results of this second stage are presented in TABLE B.2 (page 27). It is clear that states with higher public education expenditures per pupil have the higher mean incomes in every quintile. Thus, the estimated coefficients of education expenditures are positive and significant at the 95 percent level, but what is even more relevant is that a 1 percent increase in public education expenditures per pupil increases the mean of the lowest income quintile by 0.366 percent, the mean income of the second lowest quintile by 0.314 percent, the third quintile by 0.295 percent, the fourth by 0.259 percent, and the fifth by 0.136 percent. The obvious conclusion is that spending on education increases all income levels, but the impact on lower incomes is greater than on higher incomes, leading to decreased income inequality.

Another important variable affecting income levels is the level of education of each state. This is to be expected, since incomes are indeed dependent on the level of educational attainment. The level of educational attainment is measured by the percentage of college graduates in each state. This variable is a positive contributor to all income levels except for the lowest quintile.

Other correction variables in this equation were age distribution, other socioeconomic characteristics, and the industrial structure of the various states. The most significant of these variables proved to be the age distribution and the "female head of household" variables. States with a higher percentage of prime age adults in their work force also had higher incomes and states with more single female heads of households had lower mean incomes at every quintile.

The conclusion of this second stage of the empirical model is that, after adjusting for other income-affecting variables increases in public education expenditures per pupil contribute more to lower incomes than higher incomes, leading to decreased income inequality.

Effects of Education on Poverty

The third empirical stage of this study statistically measured the effects of public education expenditures by a state on its poverty levels. The results are presented in TABLE B.3 (page 28). Except for the dependent variable, which was specified as the percentage of state residents below poverty level, this equation was similar to the ones presented above. This stage logically follows the premise that, if education expenditures contribute to a decrease in income inequality then increasing lower incomes more than higher incomes could lead to the reduction of poverty rates. This result is actually confirmed by the estimated regression coefficients of this equation. The coefficient of the cumulative sum of public education expenditures by pupil was negative and highly significant at the 99 percent confidence level. This indicates that states that spent more money on public education from 1970 to 1995 experienced lower poverty levels in the year 2000. This relatively obvious conclusion is further confirmed when other factors affecting state poverty levels are considered. Several other variables have influenced poverty rates across states, and the model captures their impact. The estimated equations indicate that states with higher unemployment rates, a higher percentage of older citizens, and a higher percentage of families with female heads of households also had higher poverty rates, while states with higher educational levels had lower poverty rates. In addition, states with more people employed in manufacturing and the service industries seem to have lower poverty levels even though those coefficients are significant only at the 90 percent level of confidence.

4

Conclusions

Based on the model's statistical estimation and the discussion of empirical results, this report offers the following conclusions:

1. Public education expenditures per pupil have contributed to a decrease in income inequality across the fifty states and the District of Columbia. The effects were cumulative and took several years to materialize. This conclusion is based on the fact that the Gini coefficients of the various states were lower in the year 2000 for all those states that spent more on public education during the period, 1970–1995. This conclusion is further solidified by adjustments made for other factors affecting income inequality.

2. Public education expenditures caused decreases in income inequality across the states and the District of Columbia by contributing more to lower incomes than to higher incomes. As explained in the Empirical Findings section, states that spent more on public education during the 1970–1995 period experienced larger increases in all incomes in 2000. However, the percentage growth in lower incomes was greater than the percentage growth in higher incomes, thus causing a decrease in income inequality.

3. Public education expenditures by the fifty states and the District of Columbia contributed to reductions in poverty rates. This is consistent with the other findings, and it follows logically that, if increased public education expenditures decrease income inequality by increasing lower incomes, they should also lead to reduced poverty rates.

4. Greater income equality, increased lower incomes, and reduced poverty rates all lead to other non-economic social benefits, such as reduced crime rates and improvements in the quality of life. While beyond the scope of this study, preliminary investigation has led to significant statistical correlations between increased public education spending and decreased incidences of property crime. States with greater expenditures on public education seemed to have fewer incidences of property crime.

Appendix A
Summary Tables

TABLE A.1 Gini Ratios for Households

Year	Total	White	Black
2001	0.466	0.460	0.463
2000	0.462	0.457	0.458
1999	0.457	0.451	0.470
1998	0.456	0.450	0.466
1997	0.459	0.453	0.458
1996	0.455	0.446	0.479
1995	0.450	0.442	0.468
1994	0.456	0.448	0.477
1993	0.454	0.444	0.484
1992	0.434	0.423	0.470
1991	0.428	0.418	0.464
1990	0.428	0.419	0.464
1989	0.431	0.422	0.461
1988	0.427	0.416	0.468
1987	0.426	0.415	0.468
1986	0.425	0.415	0.464
1985	0.419	0.411	0.450
1984	0.415	0.405	0.450
1983	0.414	0.404	0.448
1982	0.412	0.403	0.442
1981	0.406	0.397	0.440
1980	0.403	0.394	0.439
1979	0.404	0.396	0.433
1978	0.402	0.394	0.431
1977	0.402	0.394	0.425
1976	0.398	0.391	0.421
1975	0.397	0.387	0.419
1974	0.395	0.387	0.414
1973	0.397	0.389	0.419
1972	0.401	0.393	0.427
1971	0.396	0.389	0.419
1970	0.394	0.387	0.422

TABLE A.2 Gini Ratios by State

	Gini household			% change
State	**1980**	**1990**	**2000**	**1980–2000**
Alabama	0.427	0.458	0.475	11.3
Alaska	0.393	0.397	0.402	2.3
Arizona	0.399	0.439	0.450	12.8
Arkansas	0.428	0.450	0.458	7.1
California	0.408	0.441	0.475	16.4
Colorado	0.392	0.426	0.438	11.8
Connecticut	0.390	0.434	0.477	22.3
Delaware	0.396	0.411	0.429	8.3
District of Columbia	0.450	0.492	0.549	22.0
Florida	0.421	0.450	0.470	11.7
Georgia	0.421	0.446	0.461	9.5
Hawaii	0.390	0.408	0.434	11.4
Idaho	0.390	0.421	0.427	9.6
Illinois	0.396	0.440	0.456	15.2
Indiana	0.379	0.411	0.424	11.9
Iowa	0.390	0.412	0.418	7.1
Kansas	0.399	0.428	0.435	9.0
Kentucky	0.420	0.456	0.468	11.4
Louisiana	0.438	0.476	0.483	10.3
Maine	0.382	0.414	0.434	13.7
Maryland	0.385	0.410	0.434	12.7
Massachusetts	0.398	0.428	0.463	16.3
Michigan	0.389	0.429	0.440	13.0
Minnesota	0.391	0.418	0.426	8.9
Mississippi	0.440	0.475	0.478	8.7
Missouri	0.408	0.438	0.449	10.0
Montana	0.395	0.421	0.436	10.4
Nebraska	0.396	0.414	0.424	7.1
Nevada	0.387	0.420	0.436	12.6
New Hampshire	0.372	0.387	0.414	11.3
New Jersey	0.393	0.431	0.460	17.0
New Mexico	0.415	0.448	0.460	10.9

continues on next page

TABLE A.2 Gini Ratios by State *(continued)*

	Gini household			% change
State	**1980**	**1990**	**2000**	**1980–2000**
New York	0.419	0.467	0.499	19.1
North Carolina	0.403	0.430	0.452	12.2
North Dakota	0.397	0.409	0.429	8.0
Ohio	0.385	0.427	0.441	14.6
Oklahoma	0.419	0.445	0.455	8.6
Oregon	0.394	0.421	0.438	11.1
Pennsylvania	0.391	0.435	0.452	15.7
Rhode Island	0.397	0.420	0.457	15.2
South Carolina	0.406	0.428	0.454	11.9
South Dakota	0.409	0.394	0.434	6.0
Tennessee	0.418	0.451	0.465	11.2
Texas	0.415	0.457	0.470	13.3
Utah	0.371	0.395	0.410	10.6
Vermont	0.386	0.385	0.423	9.5
Virginia	0.399	0.425	0.449	12.6
Washington	0.388	0.414	0.436	12.5
West Virginia	0.406	0.448	0.468	15.4
Wisconsin	0.381	0.402	0.413	8.3
Wyoming	0.372	0.395	0.428	15.1

TABLE A.3 Mean Income Shares by Quintiles (Q), 2000 ($)

State	Q1 Lowest	Q2	Q3	Q4	Q5 Highest	Q5/Q1
Alabama	6,777	19,815	34,131	52,979	115,915	17.1
Alaska	13,741	32,889	51,677	75,099	138,968	10.1
Arizona	10,250	25,580	40,571	61,000	132,231	12.9
Arkansas	7,449	19,607	32,321	48,857	105,691	14.2
California	10,808	28,691	47,580	73,569	167,491	15.5
Colorado	12,398	30,204	47,202	69,688	147,693	11.9
Connecticut	12,423	32,957	53,986	80,910	190,704	15.4
Delaware	12,177	30,090	47,420	69,704	141,535	11.6
District of Columbia	6,225	22,802	40,145	66,899	185,702	29.8
Florida	9,510	24,264	38,787	58,676	136,281	14.3
Georgia	9,410	26,075	42,676	64,337	140,564	14.9
Hawaii	11,628	30,889	49,686	74,491	148,632	12.8
Idaho	10,268	24,201	37,676	55,082	113,341	11.0
Illinois	10,872	28,832	46,575	69,578	151,864	14.0
Indiana	10,859	26,361	41,660	60,809	121,454	11.2
Iowa	10,714	25,314	39,353	56,859	113,156	10.6
Kansas	10,473	25,681	40,560	59,746	123,941	11.8
Kentucky	7,263	19,798	33,755	52,391	113,022	15.6
Louisiana	6,210	18,684	32,825	52,022	114,425	18.4
Maine	9,397	23,109	37,226	54,901	112,280	11.9
Maryland	12,977	33,502	53,061	77,946	159,782	12.3
Massachusetts	10,681	30,008	50,337	76,213	164,587	15.4
Michigan	10,856	27,624	44,658	66,807	137,054	12.6
Minnesota	12,470	30,008	47,066	68,148	139,045	11.2
Mississippi	6,131	17,981	31,344	48,903	107,216	17.5
Missouri	9,304	23,682	38,006	57,116	121,671	13.1
Montana	8,419	20,529	33,094	49,251	101,061	12.0
Nebraska	10,579	25,053	39,151	57,224	115,770	10.9
Nevada	11,787	28,764	44,554	64,747	137,489	11.7
New Hampshire	13,430	31,936	49,200	70,501	140,347	10.5
New Jersey	12,612	33,670	55,167	83,195	181,658	14.4
New Mexico	7,771	20,590	34,125	52,415	113,043	14.5

continues on next page

TABLE A.3 Mean Income Shares by Quintiles (Q), 2000 ($) *(continued)*

State	Q1 Lowest	Q2	Q3	Q4	Q5 Highest	Q5/Q1
New York	8,349	25,146	43,605	68,606	163,574	19.6,
North Carolina	9114	24,246	39,076	58,307	125,380	13.8
North Dakota	8,622	21,666	34,568	50,990	101,954	11.8
Ohio	10,036	25,563	40,985	60,865	126,732	12.6
Oklahoma	7,905	20,516	33,526	51,100	109,144	13.8
Oregon	10,394	25,847	40,917	60,583	126,340	12.2
Pennsylvania	9,506	24,483	40,052	60,455	128,913	13.6
Rhode Island	8,975	24,720	42,229	64,006	133,905	14.9
South Carolina	8,146	22,601	37,103	55,774	118,123	14.5
South Dakota	8,885	22,148	35,249	51,446	106,004	11.9
Tennessee	8,170	22,199	36,357	54,987	121,727	14.9
Texas	8,973	24,343	39,841	61,373	137,530	15.3
Utah	13,273	30,330	45,671	65,218	130,769	9.9
Vermont	10,979	25,913	40,774	59,226	119,456	10.9
Virginia	11,393	29,181	46,702	70,149	150,665	13.2
Washington	11,597	28,964	45,700	67,164	139,839	12.1
West Virginia	6,638	17,447	29,634	46,167	100,265	15.1
Wisconsin	11,830	28,068	43,814	62,749	122,854	10.4
Wyoming	9,799	23,704	37,934	55,863	111,704	11.4

TABLE A-4 Percentage of Individuals in Poverty (Poverty Rate)

Year	All	White	Black
2001	11.7	9.9	22.7
2000	11.3	9.5	22.5
1999	11.9	9.8	23.6
1998	12.7	10.5	26.1
1997	13.3	11.0	26.5
1996	13.7	11.2	28.4
1995	13.8	11.2	29.3
1994	14.5	11.7	30.6
1993	15.1	12.2	33.1
1992	14.8	11.9	33.4
1991	14.2	11.3	32.7
1990	13.5	10.7	31.9
1989	12.8	10.0	30.7
1988	13.0	10.1	31.3
1987	13.4	10.4	32.4
1986	13.6	11.0	31.1
1985	14.0	11.4	31.3
1984	14.4	11.5	33.8
1983	15.2	12.1	35.7
1982	15.0	12.0	35.6
1981	14.0	11.1	34.2
1980	13.0	10.2	32.5
1979	11.7	9.0	31.0
1978	11.4	8.7	30.6
1977	11.6	8.9	31.3
1976	11.8	9.1	31.1
1975	12.3	9.7	31.3
1974	11.2	8.6	30.3
1973	11.1	8.4	31.4
1972	11.9	9.0	33.3
1971	12.5	9.9	32.5
1970	12.6	9.9	33.5

TABLE A.5 Percentage of Households (female head, no husband present) in Poverty (Poverty Rate)

Year	All families	All races	White	Black
2001	9.9	28.6	24.3	37.4
2000	9.6	28.5	23.2	38.6
1999	10.3	30.5	24.9	40.8
1998	11.2	33.1	27.6	42.8
1997	11.6	35.1	30.7	42.8
1996	12.2	35.8	29.8	46.4
1995	12.3	36.5	29.7	48.2
1994	13.1	38.6	31.8	50.2
1993	13.6	38.7	31.0	53.0
1992	13.3	39.0	30.8	54.0
1991	12.8	39.7	31.5	54.8
1990	12.0	37.2	29.8	50.6
1989	11.5	35.9	28.1	49.4
1988	11.6	37.2	29.2	51.9
1987	12.0	38.1	29.6	54.1
1986	12.0	38.3	30.6	53.8
1985	12.6	37.6	29.8	53.2
1984	13.1	38.4	29.7	54.6
1983	13.9	40.2	31.2	57.0
1982	13.6	40.6	30.9	58.8
1981	12.5	38.7	29.8	56.7
1980	11.5	36.7	28.0	53.4
1979	10.2	34.9	25.2	53.1
1978	10.0	35.6	25.9	54.2
1977	10.2	36.2	26.8	55.3
1976	10.3	37.3	28.0	55.7
1975	10.9	37.5	29.4	54.3
1974	9.9	36.5	27.7	55.0
1973	9.7	37.5	28.0	56.5
1972	10.3	38.2	27.4	58.1
1971	10.8	38.7	30.4	56.1
1970	10.9	38.1	28.4	58.7

TABLE A.6 Percentage of Population in Poverty, by State

	% individuals in poverty				% change
State	**1970**	**1980**	**1990**	**2000**	**1970–2000**
Alabama	25.4	21.2	19.2	13.3	–48
Alaska	12.6	9.6	11.4	7.6	–40
Arizona	15.3	12.8	13.7	11.7	–24
Arkansas	27.8	21.5	19.6	16.5	–41
California	11.1	11	13.9	12.7	14
Colorado	12.3	8.6	13.7	9.8	–20
Connecticut	7.2	8.3	6	7.7	7
Delaware	10.9	11.8	6.9	8.4	–23
District of Columbia	17	20.9	21.1	15.2	–11
Florida	16.4	16.7	14.4	11	–33
Georgia	20.7	13.9	15.8	12.1	–42
Hawaii	9.3	8.5	11	8.9	–4
Idaho	13.2	14.7	14.9	12.5	–5
Illinois	10.2	12.3	13.7	10.7	5
Indiana	9.7	11.8	13	8.5	–12
Iowa	11.6	10.8	10.4	8.3	–28
Kansas	12.7	9.4	10.3	8	–37
Kentucky	22.9	19.3	17.3	12.6	–45
Louisiana	26.3	20.3	23.6	17.2	–35
Maine	13.6	14.6	13.1	10.1	–26
Maryland	10.1	9.5	9.9	7.4	–27
Massachusetts	8.6	9.5	10.7	9.8	14
Michigan	9.4	12.9	14.3	9.9	5
Minnesota	10.7	8.7	12	5.7	–47
Mississippi	35.4	24.3	25.7	14.9	–58
Missouri	14.7	13	13.4	9.2	–37
Montana	13.6	13.2	16.3	14.1	4
Nebraska	13.1	13	10.3	8.6	–34
Nevada	9.1	8.3	9.8	8.8	–3
New Hampshire	9.1	7	6.3	4.5	–51
New Jersey	8.1	9	9.2	7.3	–10
New Mexico	22.8	20.6	20.9	17.5	–23

continues on next page

TABLE A.6 Percentage of Population in Poverty, by State *(continued)*

	% individuals in poverty				% change
State	**1970**	**1980**	**1990**	**2000**	**1970–2000**
New York	11.1	13.8	14.3	13.9	25
North Carolina	20.3	15.0	13.0	12.5	–38
North Dakota	15.7	15.5	13.7	10.4	–34
Ohio	10.0	9.8	11.5	10.0	0
Oklahoma	18.8	13.9	15.6	14.9	–21
Oregon	11.5	11.5	9.2	10.9	–5
Pennsylvania	10.6	9.8	11.0	8.6	–19
Rhode Island	11.0	10.7	7.5	10.2	–7
South Carolina	23.9	16.8	16.2	11.1	–54
South Dakota	18.7	18.8	13.3	10.7	–43
Tennessee	21.8	19.6	16.9	13.5	–38
Texas	18.8	15.7	15.9	15.5	–18
Utah	11.4	10.0	8.2	7.6	–33
Vermont	12.1	12.0	10.9	10.0	–17
Virginia	15.5	12.4	11.1	8.3	–46
Washington	10.2	12.7	8.9	10.8	6
West Virginia	22.2	15.2	18.1	14.7	–34
Wisconsin	9.8	8.5	9.3	9.3	–5
Wyoming	11.7	10.4	11.0	10.8	–8

TABLE A.7 Per Student Expenditures in Public Elementary and Secondary Schools Fall Enrollment by Decade, Percentage of Change, and Cumulative
(1998–99 $)

State	1970	1980	1990	2000	% change	Cumulative (1970–95)
Alabama	2,229	3,223	4,074	5,188	133	88,736
Alaska	4,614	9,044	9,819	8,404	82	239,364
Arizona	2,938	3,953	4,817	4,672	59	109,330
Arkansas	2,225	3,120	4,185	4,956	123	88,290
California	3,630	4,719	5,835	5,801	60	119,738
Colorado	2,988	4,786	5,646	5,923	98	125,482
Connecticut	3,967	4,593	9,671	9,318	135	164,119
Delaware	3,631	5,482	6,902	7,706	112	148,128
District of Columbia	4,125	5,959	10,201	9,650	134	191,015
Florida	2,974	3,887	5,957	5,790	95	117,714
Georgia	2,347	3,160	5,183	6,092	160	99,890
Hawaii	3,450	4,422	5,352	6,081	76	129,171
Idaho	2,497	3,282	3,785	5,066	103	87,450
Illinois	3,553	4,750	5,858	6,762	90	135,174
Indiana	2,880	3,620	5,534	6,772	135	112,387
Iowa	3,477	4,587	5,429	6,243	80	123,711
Kansas	3,044	4,160	5,559	6,015	98	122,123
Kentucky	2,187	3,301	4,385	5,560	154	94,259
Louisiana	2,567	3,453	4,697	5,548	116	104,203
Maine	2,828	3,586	6,354	7,155	153	116,188
Maryland	3,525	4,859	7,222	7,326	108	150,558
Massachusetts	3,444	5,400	7,472	8,260	140	151,902
Michigan	3,665	5,289	6,596	7,432	103	143,761
Minnesota	3,724	4,867	6,088	6,791	82	133,987
Mississippi	1,990	3,324	3,801	4,565	129	82,283
Missouri	2,596	3,654	5,275	5,855	126	110,368
Montana	3,169	4,798	5,494	5,974	88	129,341
Nebraska	3,048	4,291	5,900	6,256	105	122,016
Nevada	3,074	4,044	4,945	5,587	82	111,782
New Hampshire	2,901	3,671	6,201	6,433	122	119,953
New Jersey	4,024	5,988	9,778	10,145	152	185,798
New Mexico	2,897	3,964	4,465	5,440	88	105,402

continues on next page

TABLE A.7 Per Student Expenditures by Decade, Percentage of Change, and Cumulative *(continued)*

State	1970	1980	1990	2000	% change	Cumulative (1970–95)
New York	5,202	6,253	9,137	9,344	80	203,826
North Carolina	2,484	3,466	5,207	5,656	128	100,911
North Dakota	2,885	4,115	5,053	5,442	89	109,786
Ohio	2,947	4,015	5,871	6,627	125	119,784
Oklahoma	2,412	3,835	4,267	5,303	120	101,142
Oregon	3,673	5,113	6,304	6,828	86	144,002
Pennsylvania	3,551	4,935	7,435	7,450	110	147,569
Rhode Island	3,514	4,960	7,656	8,294	136	151,230
South Carolina	2,471	3,385	4,885	5,656	129	97,941
South Dakota	2,858	3,774	4,550	5,259	84	102,310
Tennessee	2,312	3,228	4,412	5,123	122	89,711
Texas	2,401	3,687	4,969	5,685	137	106,517
Utah	2,593	3,298	3,339	4,210	62	84,086
Vermont	3,439	4,091	7,477	7,541	119	135,936
Virginia	2,851	3,866	6,077	6,350	123	114,256
Washington	3,716	5,059	5,679	6,110	64	129,494
West Virginia	2,707	3,706	5,209	6,677	147	112,907
Wisconsin	3,455	4,715	6,505	7,527	118	140,353
Wyoming	3,506	5,021	6,789	6,842	95	145,688

Appendix B
Dependent Variables

TABLE B.1 Gini Coefficient by State in 2000 (household)

Predictor	Coefficient	Std. Error	T	P
Constant	20.078	6.637	3.02	0.004
Total ed. $ 1970–95 (constant 95)	–0.00000024	0.00000011	–2.19	0.035
LOG (per capita personal income $)	–8.947	2.964	–3.02	0.004
Square of LOG (per capita personal income $)	1.0227	0.3309	3.09	0.004
Ratio of (% people with B.A. or more) % people with no high school education	–0.024923	0.005933	–4.20	0.000
Ratio of (% total population 18–24) % total population 45–64)	–0.02318	0.03179	–0.73	0.470
% unemployment	0.004188	0.002827	1.48	0.146
% female householder families (no husband, children under 18)	0.004160	0.001352	3.08	0.004
% in selected industries: manufacturing	–0.0011450	0.0005431	–2.11	0.041
% distribution by occupation: service	–0.002444	0.001366	–1.79	0.081
% non-White population	–0.0001158	0.0001908	–0.61	0.547
% rural population	–0.0000960	0.0002127	–0.45	0.654

S = 0.04512 R-Sq = 81.4% R-Sq(adj) = 76.1%

Analysis of Variance

Source	DF	SS	MS	F	P
Regression	11	0.0271875	0.0024716	17.28	0.000
Residual Error	39	0.0055795	0.0001431		
Total	50	0.0327670			

TABLE B.2 Log Mean Income of the Lowest Quintile of the Population

Predictor	Coefficient	Std. Error	T	P
Constant	2.0393	0.6122	3.33	0.002
Log total $ per pupil 1970–95 (constant 95)	0.3656	0.1040	3.51	0.001
% people with BA or more	0.003189	0.002700	1.18	0.245
% total population 18–24	–0.00639	0.01145	–0.56	0.580
% total population 25–44	0.026527	0.006563	4.04	0.000
% total population 45–64	–0.021481	0.008858	–2.43	0.020
% female householder families (no husband, children under 18)	–0.025217	0.005093	–4.95	0.000
% workers 16+ living in MSA/PMSA	–0.0004192	0.004991	–0.84	0.406
% in selected industries: manufacturing	0.002075	0.002178	0.95	0.347
% distribution by occupation: service	0.007880	0.005483	1.44	0.159
% non-White population	0.0001926	0.0007407	0.26	0.796
% unemployment	–0.018107	0.009178	–1.97	0.056

S = 0.04512 R-Sq = 81.4% R-Sq(adj) = 76.1%

Analysis of Variance

Source	DF	SS	MS	F	P
Regression	11	0.346771	0.031525	15.49	0.000
Residual Error	39	0.079387	0.002036		
Total	50	0.426158			

TABLE B.3 Log Mean Income of the Second-Lowest Quintile of the Population

Predictor	Coefficient	Std. Error	T	P
Constant	2.5390	0.4231	6.00	0.000
Log total $ per pupil 1970–95 (constant 95)	0.31373	0.07189	4.36	0.000
% people with BA or more	0.003302	0.001866	1.77	0.085
% total population 18–24	–0.003778	0.007916	–0.48	0.636
% total population 25–44	0.022215	0.004536	4.90	0.000
% total population 45–64	–0.014624	0.006122	–2.39	0.022
% female householder families (no husband, children under 18)	–0.016002	0.003520	–4.55	0.000
% workers 16+ living in MSA/PMSA	0.0000852	0.0003449	0.25	0.806
% in selected industries: manufacturing	0.002044	0.001505	1.36	0.182
% distribution by occupation: service	0.004984	0.003789	1.32	0.196
% non-White population	0.0008402	0.0005119	1.64	0.109
% unemployment	–0.013608	0.006343	–2.15	0.038

S = 0.03118 R-Sq = 85.9% R-Sq(adj) = 81.9%

Analysis of Variance

Source	DF	SS	MS	F	P
Regression	11	0.231019	0.021002	21.60	0.000
Residual Error	39	0.037919	0.000972		
Total	50	0.268938			

TABLE B.4 Log Mean Income of the Middle Quintile of the Population

Predictor	Coefficient	Std. Error	T	P
Constant	2.8748	0.3322	8.65	0.000
Log total $ per pupil 1970–95 (constant 95)	0.29462	0.05644	5.22	0.000
% people with BA or more	0.002965	0.001465	2.02	0.050
% total population 18–24	–0.005527	0.006215	–0.89	0.379
% total population 25–44	0.018781	0.003562	5.27	0.000
% total population 45–64	–0.012283	0.004806	–2.56	0.015
% female householder families (no husband, children under 18)	–0.012442	0.002764	–4.50	0.000
% workers 16+ living in MSA/PMSA	0.0002564	0.0002708	0.95	0.350
% in selected industries: manufacturing	0.002041	0.001182	1.73	0.092
% distribution by occupation: service	0.003166	0.002975	1.06	0.294
% non-White population	0.0009772	0.0004019	2.43	0.020
% unemployment	–0.009590	0.004980	–1.93	0.061

S = 0.02448 R-Sq = 89.2% R-Sq(adj) = 86.2%

Analysis of Variance

Source	DF	SS	MS	F	P
Regression	11	0.193666	0.017606	29.37	0.000
Residual Error	39	0.023376	0.000599		
Total	50	0.217042			

TABLE B.5 Log Mean Income of the Second-Highest Quintile of the Population

Predictor	Coefficient	Std. Error	T	P
Constant	3.2180	0.2774	11.60	0.000
Log total $ per pupil 1970–95 (constant 95)	0.25868	0.04714	5.49	0.000
% people with BA or more	0.002859	0.001224	2.34	0.025
% total population 18–24	–0.005564	0.005190	–1.07	0.290
% total population 25–44	0.016310	0.002974	5.48	0.000
% total population 45–64	–0.009640	0.004014	–2.40	0.021
% female householder families (no husband, children under 18)	–0.010042	0.002308	–4.35	0.000
% workers 16+ living in MSA/PMSA	0.0004998	0.0002262	2.21	0.033
% in selected industries: manufacturing	0.0015431	0.0009870	1.56	0.126
% distribution by occupation: service	0.001332	0.002485	0.54	0.595
% non-White population	0.0010847	0.0003357	3.23	0.003
% unemployment	–0.005490	0.004159	–1.32	0.195

S = 0.02045 R-Sq = 91.6% R-Sq(adj) = 89.3%

Analysis of Variance

Source	DF	SS	MS	F	P
Regression	11	0.178817	0.016256	38.89	0.000
Residual Error	39	0.016303	0.000418		
Total	50	0.195120			

TABLE B.6 Log Mean Income of the Highest Quintile of the Population

Predictor	Coefficient	Std. Error	T	P
Constant	4.0754	0.3216	12.67	0.000
Log total $ per pupil 1970–95 (constant 95)	0.13619	0.05465	2.49	0.017
% people with BA or more	0.004426	0.001419	3.12	0.003
% total population 18–24	–0.007823	0.006017	–1.30	0.201
% total population 25–44	0.012240	0.003448	3.55	0.001
% total population 45–64	–0.006089	0.004654	–1.31	0.198
% female householder families (no husband, children under 18)	–0.003819	0.002676	–1.43	0.162
% workers 16+ living in MSA/PMSA	0.0012341	0.0002622	4.71	0.000
% in selected industries: manufacturing	0.000724	0.001144	0.63	0.530
% distribution by occupation: service	–0.000041	0.002881	–0.01	0.989
% non-White population	0.0007817	0.0003892	2.01	0.052
% unemployment	0.001620	0.004822	0.34	0.739

S = 0.02370 R-Sq = 90.9% R-Sq(adj) = 88.3%

Analysis of Variance

Source	DF	SS	MS	F	P
Regression	11	0.217983	0.019817	35.27	0.000
Residual Error	39	0.021912	0.000562		
Total	50	0.239895			

TABLE B.7 Percentage Below Poverty Level

Predictor	Coefficient	Std. Error	T	P
Constant	77.96	15.49	5.03	0.000
Log total ed. $ 1970–95 (constant 95)	–15.664	2.820	–5.56	0.000
% unemployment	1.5845	0.3065	5.17	0.000
% state population over 64	0.4890	0.1503	3.25	0.002
% distribution by occupation: service	–0.3566	0.1868	–1.91	0.063
% in selected industries: manufacturing	–0.15072	0.07173	–2.10	0.042
% female householder families (no husband, children under 18)	0.5155	0.2143	2.41	0.021
Population density	–0.0010110	0.0003466	–2.92	0.006

S = 1.742 R-Sq = 70.1% R-Sq(adj) = 65.2%

Analysis of Variance

Source	DF	SS	MS	F	P
Regression	7	305.463	43.638	14.38	0.000
Residual Error	43	130.450	3.034		
Total	50	435.913			

Bibliography

Atkinson, Anthony B. 1997. "Bringing Income Distribution in from the Cold." *Economic Journal* 107: 297–321.

Becker, Gary S., and Barry R. Chiswick. 1966. "Education and the Distribution of Earnings." *American Economic Review* 56(1/2): 358–69.

Bernat, G. Andrew Jr. 2001. "Convergence in State Per Capita Personal Income, 1950–99." *Survey of Current Business* June: 36–48.

Benabou, Roland. 1994. "Education, Income Distribution, and Growth: The Local Connection." Cambridge, Mass.: National Bureau of Economic Research, Working Paper 4798.

Betts, Julian R. 1995. "Does School Quality Matter? Evidence from the National Longitudinal Survey of Youth." *Review of Economics and Statistics* 77(2): 231–50.

Betts, Julian R. 1996. "Is There a Link Between School Inputs and Earnings? Fresh Scrutiny of an Old Literature." In Gary Burtless, ed., *Does Money Matter?* (pp. 141–91). Washington, DC: Brookings Institution Press.

Bluestone, Barry. 1990. "The Impact of Schooling and Industrial Restructuring on Recent Trends in Wage Inequality in the United States." *American Economic Review* May: 303–07.

Bureau of Economic Analysis. 2001. *Survey of Current Business.* Washington, DC: U.S. Department of Commerce.

Card, David, and Alan B. Krueger. 1992. "Does School Quality Matter? Returns to Education and the Characteristics of Public Schools in the United States." *Journal of Political Economy* 100(1): 1–40.

Card, David, and Alan B. Krueger. 1996. "Labor Market Effects and School Quality: Theory and Evidence." In Gary Burtless, ed., *Does Money Matter?* (pp. 97–140). Washington, DC: Brookings Institution Press.

Dalaker, Joseph. September 2001. "Poverty in the United States: 2000." In *Current Population Reports* (pp. 60–214). Washington, DC: U.S. Census Bureau.

De Gregorio, Jose, and Jong-Wha Lee. 2002. "Education and Income Inequality: New Evidence from Cross-Country Data." *Review of Income and Wealth* 48(3): 395–416.

Durlauf, Steven N. 1996. "A Theory of Persistent Income Inequality." *Journal of Economic Growth* 1(1): 75–93.

Eckstein, Z., and I. Zilcha. 1994. "The Effect of Compulsory Schooling on Growth, Income Distribution, and Welfare." *Journal of Public Economics* 54: 339–59.

Fernandez, Raquel, and Richard Rogerson. 1996. "Income Distribution, Communities, and the Quality of Public Education." *Quarterly Journal of Economics* 111(1): 135–64.

Fernandez, Raquel, and Richard Rogerson. 1998. "Public Education and Income Distribution: A Dynamic Quantitative Evaluation of Education-Finance Reform." *American Economic Review* 88(4): 813–33.

Fields, G. 1980. "Education and Income Distribution in Developing Countries: A Review of the Literature." In T. King, ed., *Education and Income* (pp. 231–315). Washington DC: World Bank Staff Working Paper No. 402.

Gottschalk, Peter, and Timothy M. Smeeding. 1997. "Cross-National Comparisons of Earnings and Income Inequality." *Journal of Economic Literature* 35(June): 633–87.

Hanushek, Eric A. 1986. "The Economics of Schooling: Production and Efficiency in Public Schools." *Journal of Economic Literature* 24(3): 1141–77.

Hussar, William, and William Sonnenberg. 2000. *Trends in Disparities in School District Level Expenditures per Pupil.* Washington, DC: National Center for Education Statistics.

Iceland, John. 2003. "Dynamics of Well-Being: Poverty 1996–1999." In *Current Population Reports* (pp. 70–91). Washington, DC: U.S. Census Bureau.

Ishikawa, Mamoru, and Daniel Ryan. 2002. "Schooling, Basic Skills, and Economic Outcomes." *Economics of Education Review* 21: 231–43.

Jones, Arthur F. Jr., and Daniel H. Weinberg. 2000. "The Changing Shape of the Nation's Income Distribution: 1947–1998." In *Current Population Reports* (pp. 60–204). Washington, DC: U.S. Census Bureau.

Knight, John B., and Richard H. Sabot. 1983. "Educational Expansion and the Kuznets Effect." *American Economic Review* 73(December): 1132–36.

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

Levy, Frank, and Richard J. Murnane. 1992. "U.S. Earnings Levels and Earnings Inequality: A Review of Recent Trends and Proposed Explanations." *Journal of Economic Literature* 30(3): 1333–81.

Murray, Sheila E., William N. Evans, and Robert M. Schwab. 1998. "Education-Finance Reform and the Distribution of Education Resources." *American Economic Review* 88(4): 789–812.

Ngarambe, Octavian, and Stephan J. Goetz. 1998. "Determinants of Regional Income Distribution in the U.S. South, 1980–1990: Roles of Net Migration and Human Capital Accumulation." *Review of Black Political Economy* 26(2): 23–35.

Partridge, James S., Mark D. Partridge, and Dan S. Rickman. 1998. "State Patterns in Family Income Inequality." *Contemporary Economic Policy* 16(3): 272–94.

Persson, T., and G. Tabellini. 1994. "Is Inequality Harmful for Growth: Theory and Evidence." *American Economic Review* 84: 600–622.

Piketty, Thomas, and Emmanuel Saez. 2003. "Income Inequality in the United States, 1913–1998." *Quarterly Journal of Economics* 108(1): 1–39.

Schultz, T.W. 1963. *The Economic Value of Education.* New York, NY: Columbia University Press.

Sylwester, Kevin. 2002a. "Can Education Expenditures Reduce Income Inequality?" *Economics of Education Review* 21: 43–52.

Sylwester, Kevin. 2002b. "A Model of Public Education and Income Inequality with a Subsistence Constraint." *Southern Economic Journal* 69(1): 144–58.

Weinberg, Daniel H. 1996. "A Brief Look at Postwar U.S. Income Inequality." In *Current Population Reports* (June, pp. 60–191). Washington, DC: U.S. Census Bureau.

Winegarden, C.R. 1979. "Schooling and Income Distribution: Evidence from International Data." *Economica* 46: 83–87.