Appendix Table A-1

Sample Sizes, Population Shares, Mean Earnings and Mean Spending Per Pupil by

Worker Type, for Three Typologies

Type:	Black	White
Observations	2737	14475
Estimated share of population, 1966	12.0%	88.0%
Estimated mean earnings of workers in this type, 1966-81	385.34	533.96
Mean spending per pupil, (`000s)	2.091	2.243

Type:	Parental Ed. < 9	Parental Ed. 9-11	Parental Ed. = 12	Parental Ed. > 12
Observations	3907	3201	6860	3244
Estimated share of population, 1966	21.1	17.0	39.0	23.0
Estimated mean earnings of workers in this type, 1966-81	493.54	523.45	586.40	631.72
Mean spending per pupil, (`000s)	2.138	2.202	2.179	2.261

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Endnotes

[1] See Evans, Murray and Schwab (1997) for a review of court-ordered spending equalization in the United States.

[2] See for instance the review by Betts (1996).

[3] See Coley (2002) for evidence of large achievement gaps in reading and mathematics skills among U.S. kindergarten students. These gaps are strongly related to socioeconomic status.

[4] It is possible that the disadvantage that children from less educated parents face is not only social and cultural, but genetic. In either case, the disadvantage has a source beyond the control of the individual, and hence should be rectified at the bar of equal opportunity.

[5] We admit this is arbitrary, yet it would be worse to attempt to make no correction for the fact that absolute levels of effort are not the right measures to compare, across types. Discovering the 'right' way to compare effort across types is a problem intrinsically as complex as comparing the subjective welfares of very different individuals.

[6] For a description of this legislation, and its impact on overall educational spending between 1980 and 1990, see section IV of Hanushek and Rivkin (1997).

[7] For reviews of this literature see Betts (1996), Heckman, Layne-Farrar and Todd (1996) and Card and Krueger (1996).

[8] One issue in the past literature has been whether there is measurement error in district reports of spending per pupil. This data-set does not contain repeat measures of spending per pupil, but other papers point to, at best, a modest effect of measurement error. Betts (1995), in a model of log wages as a function of school-level resources using the National

Longitudinal Survey of Youth 1979, instruments school-level measures of resources with state-level averages and does not find an increase in the level of significance, even though the state-level measures by themselves are significant if placed in the log wage equation. One interpretation is that the state-level aggregates are measuring something orthogonal to resources at the high school level. Grogger (1996) performs a similar analysis with High School and Beyond, modeling log wages as a function of spending per pupil. Uniquely, his paper also has two measures of spending per pupil at the district level, for two different years. When he instruments one measure with the other measure, coefficients do rise, suggesting some measurement error in the data. However, his preferred estimates suggest an elasticity of wages with respect to spending per pupil that is quite close to our own estimates. For instance in our black-white typology we find an elasticity of 0.116 and 0.119 for blacks and whites respectively. Grogger, using OLS, obtains an elasticity of 0.068, but when he instruments one measure of district spending per pupil with the other district measure, his average elasticity rises to 0.097, which is still slightly below our estimate.

[9] For more details on quantile regression see for instance Koenker and Bassett (1982).

[10] Conservative in that sense that Robert Nozick (1974) says that a person is morally entitled to benefit by virtue of luck -- for instance, by being born into a wealthy family.

[11] Taking all observations in 1966, the weighted mean spending per pupil, in 1990 prices, was $2233. Spending per pupil has grown steadily since then. Current expenditures per pupil in American public schools during the 1990-91 school year were $4847. (National Center for Education Statistics, 1991, p. 155).

[12] Appendix Table A-1 shows estimates of the share of the population of men in 1966 by type, and mean spending per pupil by type. These were calculated using sampling weights from 1966, on all available 1966 observations. This table also shows weekly earnings by type averaged over all wage observations in all years, using sample weights. The frequencies of worker types do not exactly add up due to a slightly smaller sample once observations missing covariates such as parental background are removed.

[13] Data for 1996 earnings by race and data for the Consumer Price Index required to deflate to 1990 prices were taken from U.S. Bureau of the Census. (1997, pages 431, 497).

[14] Indeed, Ward Connerly, who spear-headed the initiative on the University of California Board of Regents to abolish race-based affirmative action admissions holds this view. He said, "UC should use economic status and other genuine hardships when making special admissions, not race". (Sacramento Bee, May 20, 1995, p. B1)

[15] We use $2500 to provide comparability with the simulations based on the EOp solutions presented in the previous section. Because the actual mean spending per pupil was slightly below $2500 in the sample, we increased spending per pupil proportionately across workers, and calculated the predicted gain in earnings using the quantile regression results.

[16] This real interest rate was calculated as the yield on ten-year federal bonds minus the percentage change in the Consumer Price Index (for all urban consumers) for the period 1953 to 1997. Sources are the Economic Report of the President (Council of Economic Advisers, 1998) and the Bureau of Labor Statistics respectively.

[17] In an early draft of this paper we also calculate the impact and cost of increasing the school-leaving age by one year, based on OLS regressions of log earnings on years of schooling. This is only a rough estimate of what increasing the school-leaving age might do. Still, the results are illuminating. Along the lower earnings envelope in our black/white typology, average weekly earnings are predicted to increase by $2.38, at a cost in present value terms of $142.25. Both the predicted impact and the costs are extremely small compared to the impact and cost of the 'no-lose' EOp scenario. When compared to the EOp program that increases total spending per pupil, increasing the school-leaving age is predicted to have a proportionately bigger impact on the objective function than on cost. But this is to be expected given our earlier argument that the ratio of the benefit of EOp to spending increase is a decreasing function, which reduces the effectiveness of large increases in spending per pupil.

[18] All figures in 1990 prices. Authors' calculations based on U.S. Department of Education (2003), page 196.