GLOBAL WORKERS, LOCAL SCHOOLING: AN EXAMINATION OF HUMAN CAPITAL INVESTMENT IN VIRGINIA

by

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ABSTRACT

Local employment opportunities are hypothesized to influence educational attainment decisions made by high students, measured by the dropout percentage and the post-secondary education percentage. Data from 1990, 1980 and 1970 are used to estimate these relationships in Virginia's 133 school districts. Secretary of Labor Robert Reich's framework, developed in the Work of Nations: Preparing Ourselves for 21st Century Capitalism, is adopted to incorporate changes in the global labor market.

ACKNOWLEDGEMENTS

To the youngest generation of my family, Sean, Jamie and Dylan, I dedicate this thesis, in the hope that as they grow they find intellectual depth and understanding in all of their pursuits.

To my thesis advisors, Jan, Tom and Judy, thank you for your support and advice throughout the process! We made it!

To my friends and classmate at Virginia Tech, thank you for your support and the many great experiences! Good luck to everyone!

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CHAPTER I

IMPACT OF LABOR MARKET RESTRUCTURING ON EDUCATIONAL ATTAINMENT

The role which education plays in the economic development of communities and national economies has long been recognized as important. While many studies have examined the influence of educational attainment on economic development (see Killian and Parker, 1991), this study looks at the impact of the level of community economic development on collective educational decisions of high school students. In addition, this study examines the effects of the quality of local schooling on educational attainment. Economic development is captured in part in the quality of labor market opportunities available to students at the community level. With the global economic restructuring of the past two decades have led to new definitions of what is quality employment in local communities.

For some communities, poor quality employment opportunities create disincentives to education or skill acquisition, which in turn lowers future local employment opportunities. Certain communities find themselves in a cycle of undereducation and underproductivity, unable to create sustainable employment levels and adequate standards of living for present and future generations.

Historically, public policy has reflected the relationship between employment opportunities and educational attainment. During the "War on Poverty," President Johnson's Council of Economic Advisors saw the importance of enabling the poor to be more productive (Sawhill, 1988). Programs such as Head Start and the Job Corps were established to assist low income children and workers to attain necessary education and training skills. The fact that poverty remained led several advocates of human capital theory (Thurow, 1975; Bowles and Gintis, 1976; and Jencks, 1972) to emphasize the importance of labor demand and the rewards to education.

The quality of schooling attained is another important determinant of labor market incentives for education. Nachtigal and Hobbs (1988) claim school performance often reflects a community's economic performance, so much so that the economic differences among rural communities have "great predictive power for school success." Hobbs (1987) suggests that the economy of the local area has more impact on the local school system than the school system has on the local economy.

This study examines the hypothesis that local labor market signals influence student human capital investment decisions. Human capital is defined as any acquired

skill, training or education which enhances the productivity or expected income of labor in the marketplace. This includes health services as well as migration. Globalized definitions of occupation, as developed by Robert Reich, will be used in the testing of that hypothesis. School quality, suggested to be a factor in determining the rate of return to education, is hypothesized to be another important predictor of educational attainment. These concepts will be incorporated in a study of Virginia's 133 school districts in 1970, 1980 and 1990.

1.1 Economic Restructuring

Recent popular views regarding economic restructuring highlight changes occurring in the global marketplace. Words such as "global" and "international" have become a part of daily communication. Johnson (1987) delineates these global trends, their consequences and resulting economic strategies. Schettkat (1992), Reich (1991) and Appelbaum and Schettkat (1990) discuss the impacts of economic restructuring upon labor markets.

The opening of global markets has occurred largely since the end of World War II and has been assisted by national governments, transnational corporations as well as by other transnational organizations. Growth in the global economy has created internal changes for wealthy economies as well as for poor economies. Following World War II, the leaders of Western nations moved to integrate their national economies through the General Agreement on Tariffs and Trade, the International Monetary Fund and the

World Bank. The leaders aimed to prevent another world war, hoping interdependent trading linkages would reduce the incentive to make war with one another. The development of multiple centers of economic power in the world, the computer and telecommunications revolution, and other political and economic factors have fostered the expansion of the global economy.

Increasingly, skill is a component of work and production (Teixeira and Mishel, 1991). Although the rate of growth of skill upgrading slowed in the 1980's[1], skill-intensive occupations are on the increase. Meanwhile, service sector employment, much of which can be characterized as low-paying and low-skill, continues to grow in the urban and rural United States (Miller and Bluestone, 1988; Hirschl and McReynolds, 1989; Porterfield, 1990).

Other authors have studied changing wage differentials of skilled and non-skilled labor. Bluestone and Harrison (1988) find a "U turn" trend in low-wage employment from 1963 to 1986. The U-turn describes the following: low wage employment dropped from 21.4 percent of the workforce in 1963 to 12.5 percent in 1970; however, by 1986 the percentage was up to 17.2 percent. Bound and Johnson (1992) find technical change favors skilled workers and explains a large portion of the growing wage differential between skilled and unskilled workers. Juhn, Murphy and Pierce (1993) examine the rise in wage inequality from 1963 to 1989, during which time real wages for the least skilled

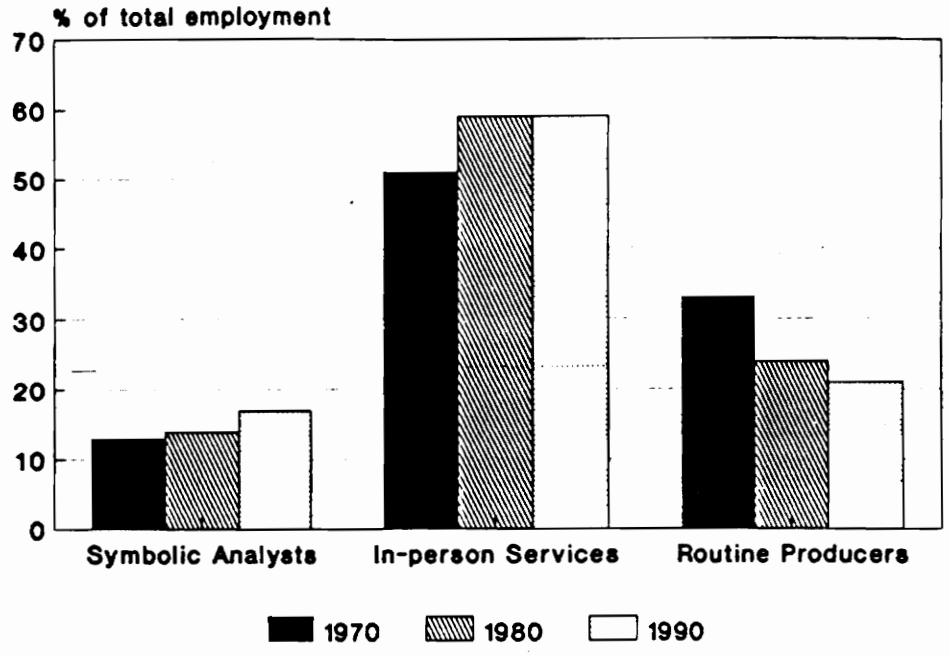
[1]Teixeira and Swaim (1991) cite a study of Howell and Wolff's, where the author's find a 7.1, 4.7 and 2.8 percent increase in the substantive complexity of jobs from 1960-70, 1970-80, and 1980-85, respectively.

fell by 5 percent and wages for the most skilled grew by 40 percent[2]. For people who have attained at most a high school degree, the results are more pronounced. The bottom 40 percent of wage earners who are high school graduates without post-high school education and with 1-10 years working experience lost 10-17 percent in real wages between 1964 and 1989. Only the top 30 percent of wage earners with only a high school degree have gained in real wages since 1964, leaving the remaining 70 percent with lower real wages.

Within the context of global economic restructuring, Robert Reich (1991) presents a framework in which a single national economy no longer exists, but increasingly labor finds itself in several "boats" defined by occupation (which is determined by educational attainment). Importantly, a workers' well-being relies on the well-being of his/her occupational "boat." Reward in the labor market is increasingly defined by the type of work performed, as some occupational groups are more successful than others. This is supported by the work of Bound and Johnson (1992), Bluestone and Harrison (1988) and Juhn, Murphy and Pierce (1993) as discussed above. For many, job quality is no longer determined by national demand, but by global demand. This concept applies to regional development in the South and within Virginia, as the type of work performed determines job security and earnings, as well as the types of jobs which will be available in the future. Figure 1 shows the change in composition of Virginia's labor force during the

[2] The least skilled is measured by those falling beneath the tenth percentile of the wage distribution, while the most skilled is measured by those above the ninetieth percentile.

1970's and 1980's using Reich's three principal occupational categories.



Source: Bureau of the Census, 1970-90

Figure 1. Percentage of Employment in Reich-defined Occupations 1970-1990

Reich distinguishes between four occupational groups: symbolic analysts, in-person service providers, routine good producers and resource producers. Symbolic analysts are those whose occupations bring together ideas, brokering concepts into profitable or beneficial action. Engineers, investment bankers, and professional consultants are examples of this highly educated and specialized labor force. Education

requirements are generally a university undergraduate or graduate degree. Income depends upon the individual's ability and speed in identifying or solving problems.

For symbolic analysts, "work occurs wherever and whenever ideas are communicated" (Reich, p. 236), which is often not in rural areas. Areas such as New York, Los Angeles, Boston and Washington D.C. specialize in finance, entertainment, engineering or international affairs. Therefore, it is not surprising that an urban/suburban/rural[3] differential exists in occupational structure as well as educational attainment levels. Figure 2 demonstrates urban/suburban/rural differentials for symbolic analyst occupations in Virginia from 1970 to 1990.

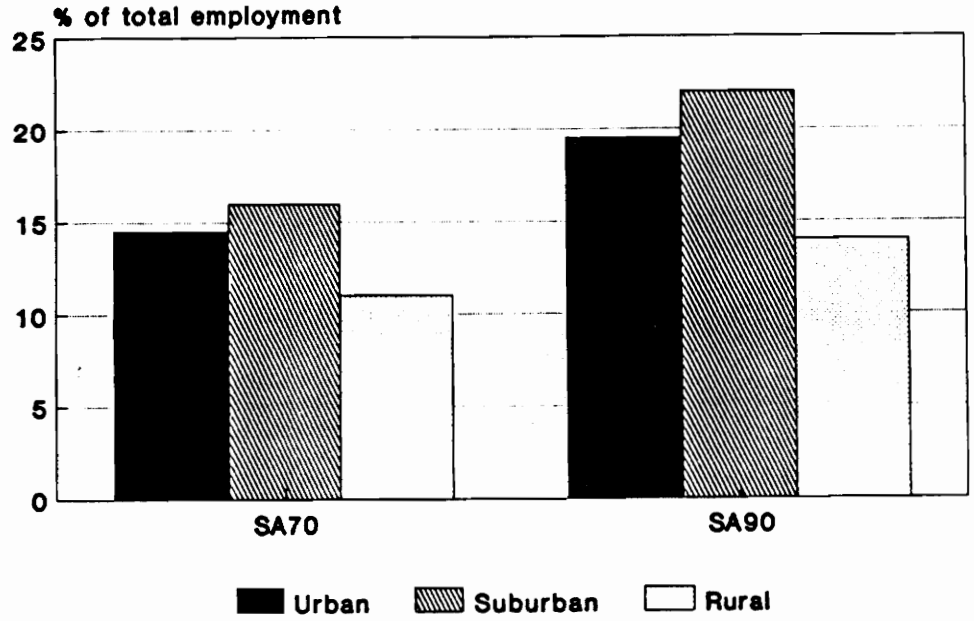


Figure 2. Percentage of Symbolic Analysts in Urban/Suburban/Rural Virginia 1970 and 1990

[3] Urban areas in Virginia include Richmond, Norfolk, Roanoke and Petersburg. Beale codes were used to separate suburban and rural areas. Suburban areas are metropolitan counties and independent cities as classified by the Beale Code, excluding urban areas. Rural areas are nonmetropolitan counties and independent cities as classified by the Beale code.

In-person service providers perform "person-to-person" tasks within the local economy. Examples of such occupations are teachers, secretaries, restaurant workers or day care workers; the skill levels range from the highly specialized to the unskilled. Education needs are broad and their income results from hours worked or amount of work completed as well as the prosperity of their clients. In-person service providers are not directly involved in global competition, unlike the other two occupational groups.

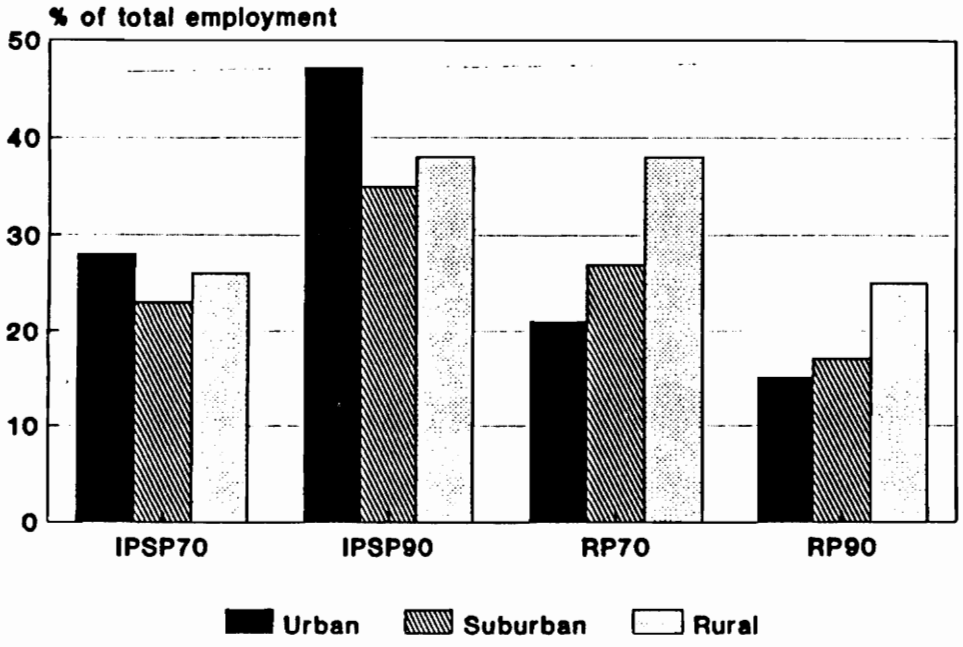
Divergent skill requirements exist within the in-person service providers category. Therefore, a high- and low-skill group is developed according to 1980 educational attainment levels in service positions. The assumption is that occupations with higher levels of educational attainment are more skill-intensive. Table 3.4 on page 40 displays the division of in-person service providers into low- and high-skill service occupations.

Routine production workers perform repetitive tasks to manufacture or create a marketable good for the global market. A basic high school education usually suffices and wages are also hourly or based on the amount of work produced. Resource producers, such as farmers, loggers, etc., are classified as a separate group from the other three occupations as resource producer demand is independent from the rest of the framework. Resource producers are most like routine producers in they produce high-volume, low-valued goods for a global market. The two occupational categories differ in that production facilities for routine producers are footloose (in that they move in search of lower production costs), while the location of resource producers is dependent upon the natural resource supply.

While the national economy undergoes shifts, rural areas in the United States also are experiencing change. Within this century, rural areas have seen shrinking employment in resource production (Hayami and Ruttan, 1971; and Johnston and Kilby, 1975) and recently, declines in manufacturing jobs and growth in the service sector (Porterfield, 1990). Teixeira and Swain (1991) find differentials in skilled labor demand in metro/non-metro localities, as non-metro areas are more likely to retain low-skill occupations. A recent publication of the Rural Sociological Society Task Force on Persistent Poverty reports "rural America suffers primarily from a deficit of good jobs, not good workers . . . and good jobs are the major route out of poverty" (p.41-42). Along the same line of reasoning, McGranahan and Ghelfi (1991) find that in the 1980's the problem for rural areas was more a shortage of demand for educated labor than a low supply of human capital. Rural areas in Canada have experienced a similar transition as well (Bollman, Fuller, and Ehrensaft, 1992).

Figure 3 shows changes in in-person service providers and routine producers and for Virginia by type of locality. The figure demonstrates a shift in the share of employment from routine producers into in-person service providers. The largest gains for service employment percentages are in the urban area, while the largest declines in routine production percentages are in the rural area.

Figure 3. Service providers and Routine Producers in Urban/Suburban/Rural Virginia Two Decade Changes



Source: Bureau of The Census, 1970-90

1.2 Reich's Framework and Educational Attainment

An important question resulting from changes in the global economy and in the labor market follow: In general, do the characteristics of local labor markets influence educational attainment decisions? Reich's framework identifies occupational categories in terms of whether they are linked (symbolic analytic and routine producer jobs) or not (in-person service occupations) to the global economy, and among those which are linked, whether they are favored by the emerging global economy (symbolic analysts) or are not favored (routine producers).

It is proposed that those features--along with skill requirements for the different types of jobs--are related to decisions as to whether to continue or leave school. Implicit in this approach is the expectation that Reich's categories, measured at the community level, will be more closely associated with school attainment in 1990 than in 1970, when many features of the global economy were only beginning to appear. Specifically, the presence of symbolic analysts in the local labor market may signal to high school students to invest in human capital, as measured by postsecondary education percentages[4]. In a related fashion, the presence of routine producers in the local labor force may be a signal to students to cease their education and begin earning wages before completing high school. In terms of the occupational category which is not linked to the

[4] Post-secondary education is measured by the percentage of high school graduates who indicate that they plan to enroll in a vocational school, two-year or four-year college the following year.

global economy--in-person services--it is proposed that the principal explanatory factor in predicting school continuation is whether a high proportion of the local work force is in high- or low-skilled in-person service occupations.

CHAPTER II

LITERATURE REVIEW

2.1 Human Capital Theory

T.W. Schultz is credited with the introduction of human capital theory (1961), which provides a framework for examining education and training decisions of individuals, firms and societies. Examples of human capital investment include expenditures on education, health, job experience and internal migration. Schultz looks at human capital as a productive investment, similar to physical capital, in that investments lead to future gains in productivity and income. Schultz notes the level of educational attainment in the labor force rose 8.5 times between 1900 and 1956, while the stock of reproducible capital rose 4.5 times. He contends that most of the rise in real earnings for workers is a result of human capital investment. He estimates 18 to 30 percent of the increase in U.S. total income from 1929 to 1956 is explained by human capital investment. Schultz concludes with several policy implications to encourage

investment in human capital and subsequent productivity gains.

Becker (1962) provides a rigorous treatment of the optimization of income with respect to on-the-job training or education, as well as a discussion of other influential factors such as migration, information, risk aversion/neutrality/affinity. The future stream of expected earnings is the individual rate of return on investment minus the opportunity cost of time in school along with direct money outlays. Therefore, students will invest if the increase in future earnings (the value of their marginal productivity gain) is greater than or equal to the cost of attending school (direct cost and opportunity cost). Otherwise, schooling does not reward students with sufficiently greater earnings. Also, schooling steepens the age-wage relationship[1].

Human capital theory, as developed by Schultz and Becker, provides a conceptual foundation for this study. The hypothesis that economic incentives (earnings) influence education decisions is central to the design of this study. Furthermore, local economic development (the combined economic signals of a community) is hypothesized to influence community-level educational attainment.

Becker and Chiswick (1966) analyze the relationship between earnings distributions and human capital investment distributions in the United States. The optimum behavior for the individual is to invest in human capital in an amount that maximizes his/her economic welfare. Varying costs of, and benefits from, human capital

[1] The age-wage relationship is a curve resulting from age on the horizontal axis and wage on the vertical axis. As the curve steepens increases in earnings are delayed, while larger marginal returns are realized.

result in individual supply and demand schedules for education. A rate of return on human capital investment for low, medium and high education groups is calculated revealing an increase in the rate of return with an increase in education. Interestingly, the earnings explained by schooling is considerably higher in the South than in the non-South, suggesting a possible shortage of human capital in the South. The higher returns in the South are hypothesized to reflect the relative scarcity of available skilled labor resulting from educational opportunities which are not commensurate with skilled labor demand.

Mincer (1974) applies human capital theory to income distributions, examining the distribution of earnings within age and/or education groups as well as for the population of white, non-farm men in 1959. The author finds 50 percent of aggregate inequality is explained by schooling and post-school investment distributions, such as experience and on-the-job training. Mincer examines the relationship of varying wage differentials to schooling levels. One finding is that wage inequality is greater for higher levels of schooling (16 years) than for lower levels of schooling (8 years). Also, Mincer finds the elasticity of human capital investment to earning abilities increases with schooling level.

Becker and Chiswick, (1966) and Mincer (1974) provide empirical support for human capital theories. By demonstrating a relationship between earnings and education decisions, the hypotheses of Schultz and Becker are verified. Again, taking this empirical evidence one step further, the present research examines the relationship

between community-level employment opportunities and education decisions made by young people in high school. The current study, therefore, attempts to expand empirical support for the importance of human capital from the individual level to the level of the locality, placing the individual within an economic environment.

2.2 Job Signaling

The work of Spence (1973) and Smith (1989) puts the relationship between economic development and human capital investment into an broad-based, encompassing theory. Spence (1973) discusses the framework of job signaling from employer to employee. The author develops a theory of informational feedback connecting supply and demand of labor. Employees match themselves to the market by optimizing returns and costs to alterable characteristics (termed signals), such as education, but also by their innate traits (termed indices), such as gender or race. Employers estimate the marginal product of a new worker from signals and indices and in turn offer an appropriate wage. The wage then sends a signal to future employees and influences their choices about the signals, such as education, they will provide employers. Optimal choice of education will depend both on the available wage and the costs facing the individual. Within this framework, individuals will rationally invest or not invest in human capital.

Smith (1989) develops a framework in which industry, community and the individual are joined in the process of determining the "future employability of local labor supplies." A local demand for educated labor creates public as well as private

private demand for education. The supply of educational services is also a function of outside sources, such as the state government's investment rate in educational facilities, etc.. Within the community, future generations will invest in human capital with respect to their individual preferences for education. The aggregated education investment of all individuals in the community determines the "employability" of labor or the attractiveness of the labor in retaining and expanding local industry.

The innovative works of Spence and Smith brings together the labor market and the decision to invest in human capital. Both present useful paradigms to better understand the complex relationship between work and education. The complex decision of human capital investment is captured within the context of a variable economic and social climate. Both theoretical pieces are relevant to the conceptual basis of this study in that the incentives, which encourage/discourage human capital investment, are examined in a social and economic setting at the community level.

2.3 Rational Underinvestment

Rational underinvestment is one theoretical perspective espoused by the Rural Sociological Society Task Force on Persistent Poverty (1993) to explain underdevelopment in the rural United States. In the framework, human capital theory is expanded to include the rational underinvestment in education by individuals, employers and local communities given local labor market incentives. Workers do not invest in education or skills acquisition if the labor market will not reward their investment, through significant

invest in education or skills acquisition if the labor market will not reward their investment, through significant increases in earnings. Local governments are discouraged from investing in local schools, since the local governments lose the investment when students migrate. Industries which prefer low-skilled, non-union labor also have no incentive to invest in local schools as an improvement in the schools would benefit other firms. In summary, "*the fundamental problem resides in low wages and inadequate employment opportunities found in rural America, especially among young adults, minorities, women and the least educated*" (p.64).

Applying the rational underinvestment theory, Stallmann, et al. (1993) examined the influence of local labor market incentives on educational attainment levels in Virginia for 1980. A positive relationship is found between the percentage of the labor force in service occupations and the dropout rate, while a negative relationship is found between the dropout rate and the percentage of the labor force in managerial occupations. Also, a positive relationship is found between the percentage of the labor force in managerial occupations and the percentage of graduates continuing beyond high school. The findings suggest that communities need a strategy of carefully targeting job creation to include more professional and managerial positions, as well as providing information to students on job opportunities and training outside of the local labor market.

Broomhall (1991) examined the impact of perceived employment opportunities by youth, as well as socio-economic characteristics of high school students, on

educational performance of students in four Appalachian counties in Virginia and Kentucky. The author finds that parental and community influences are significantly related to educational decisions made by youth in the four counties. Also, the student's valuation of education is important in determining educational achievement and educational and occupational aspirations.

DeYoung (1985) found a relationship between county income and educational status in Kentucky. Manufacturing counties in Appalachian Kentucky have fewer economically deprived children as well as higher educational standards compared to the rest of the region. Per capita income is positively associated with high school graduation rates and farming and mining income are significantly associated with more below-average readers. Mining income is negatively and significantly related to local financing of schools, while per capita income and manufacturing income are positively related to local school funding.

These studies (Rural Sociological Society Task Force on Persistent Poverty, 1993; Stallmann, et al., 1993; Hobbs and Hobbs, 1979; Broomhall, 1991; and DeYoung, 1985) are important bridges from traditional human capital studies discussed earlier to models which consider the environment in which education decisions are made. All of these studies look at educational decisions in less developed communities. Importantly, community-level structural variables are described which contribute to educational attainment. Rational underinvestment presents a framework in which pockets of poverty develop and inhabitants remain in a

cycle of poverty. If economic incentives are not present today to encourage students to attain an acceptable level of education, then future employment opportunities will be limited indirectly by the low human capital stock. It is a process which conceivably could continue for many generations.

2.4 School Quality

Welch (1966) introduced the idea that both the quality and quantity of schooling affect the rate of return to investments in education. He examines rural farm males in forty-five states in the United States, aged twenty-five years and older, who earned income in 1959. Welch creates an education production function and introduces input factors which influence the quality of schooling. The factors considered are teacher salaries, a measure of the teacher quality, and the size of the secondary school. Schooling is measured by the amount of time spent in school, while educational output results in level of earnings. The results of the regression indicate that physical labor and education each account for 38 percent of the factor share of output, while non-labor inputs account for 24 percent.

Morgan and Sirageldin (1968) examined gains resulting from more educational resources brought to bear in the year, and therefore "the question of whether the correct social policy is more years of school or more expenditure per year" (Morgan and Sirageldin, p. 1069). The results of this study suggest that a $1.00 increase in per pupil expenditures leads to a $0.24 increase in hourly earnings. Accounting for the

gain resulting from twelve years of schooling, the return is more than 15 percent over a working lifetime of 40 years. Interestingly, the authors cite the importance of local job opportunities, especially in rural areas, as a factor in the education decision.

Behrman and Birdsall (1983) also examine returns from school quality. Figure 4 demonstrates the influence of schooling quality on the traditional Mincerian model, which optimizes years of schooling subject to the rate of return and foregone earnings. Y is the level of income without any schooling and Y_s is the income resulting from acquiring schooling. Note that income at Y results from beginning work earlier, where time is measured along the horizontal axis. "S" measures the number of years spent in school. $Y_s|Q_1$, $Y_s|Q_2$, and $Y_s|Q_3$ represent varying levels of income given the school quality, where $Q_1 < Q_2 < Q_3$. The authors estimate an equation using data from a random sample in Brazil for 1970. The measure of school quality is the average level of schooling for teachers in the area in which the person went to school. The authors find a private rate of returns to schooling of 21.6 percent at one standard deviation above the mean for school quality, while the same rate at the mean is 11.7

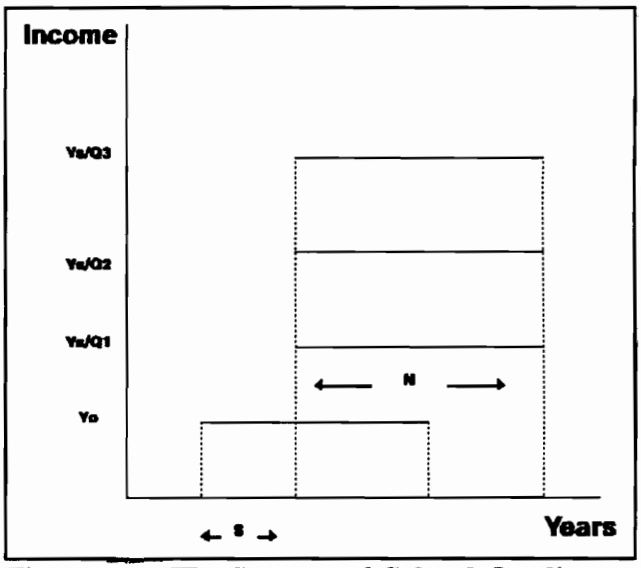


Figure 4 The Impact of School Quality on Income.

percent. A social rate of return to quality is estimated to be higher than to quantity of schooling, which is supported by similar findings in other studies.

Next, Behrman and Birdsall allow the variable measuring income (without any schooling) and the variable measuring the rate of return to quantity and quality of schooling to vary according to geographical region as well as the level of urbanization. The inclusion of the quality variable reduces the unexplained variance in regional and urban/rural income differences by half and to near zero, respectively. In conclusion, the authors warn against overstated estimates of the returns to quantity of schooling without consideration given for differences in the schooling quality.

Johnson and Stafford (1973) examine the relationship between quantity and quality of education using survey data across the 50 states. The independent variables in the regression are years of job experience, years of schooling, a dummy for urban location/origination, along with school quality (measured by annual state expenditures per elementary pupil). The authors compare the coefficients with and without the quality measure and report little change, and therefore, little bias in the estimate of returns to quantity of schooling. Also, the authors find no changes in the explanatory power of per pupil expenditures when testing for differences in region, age and father's education. Johnson and Stafford formulate an "iso-wage contour", which represents the combination of education and expenditures per pupil that give a constant level of human capital. The authors estimate that an additional dollar in per pupil spending leads to a .09 percent decrease in the amount of schooling necessary to

attain an identical level of human capital without the additional spending.

The rate of return for a person with 12 years of schooling from an increase in per pupil expenditures of $150 to $175 is 16.6 percent, which is higher than those reported for quantity of schooling. Johnson and Stafford finally examine the impact of quality upon the quantity of schooling, as the quality/quantity relationship contributes not only to potential earnings, but also to the attractiveness of education.

Rizzuto and Wachtel (1980) focus on marginal social rates of return to both quantity and quality of schooling, again similar to Johnson and Stafford. The results show higher rates of return for quality of schooling than for quantity of schooling. For example, the return, assuming the average expenditures per pupil, going from 8 to 12 years of schooling was 5.18 percent for blacks and 6.53 for whites in 1959. For the quality of schooling, the comparable rate of return was 12.37 percent for blacks and 13.23 percent for whites in 1959.

Card and Krueger (1992) also examine the relationship between school quality and returns to education. The measures of quality for the state school systems are student-teacher ratio, length of school year and teachers salary. Specifically for the student-teacher ratio, a negative and significant relationship was found. Also, the percentage of students enrolled in private school, which had an insignificant coefficient, suggests that increases in private school attendance does not by itself affect returns to education from the public system.

The studies initiated by Welch in 1966 support inclusion of school quality as a

component of measuring the rewards to educational attainment. Each author finds significant relationships between school quality and earnings, although school quality is measured in various ways. The most common measurement of school quality is expenditures per pupil, while student-teacher ratio and the teacher's level of schooling are used as well. Within the human capital framework, the quality of schooling influences the returns to investment, and therefore the level of investment. At the local level, if a high school student perceives the value of his/her education to be low, he/she is less willing to invest in human capital. Therefore, the quality of local schooling affects the student's valuation of educational attainment, as well as future earnings within the local labor market.

Hanushek (1989) challenges the traditional education production function approach, which measures school quality or performance[2] resulting from input factors, such as expenditures per pupil, size of the classroom and teacher's salary. The author reviews 187 studies which have examined the influence of input factors in determining schooling output. Teacher/pupil ratio, teacher education and experience were the most popular input measures in all of the studies, while their positive influence and statistical significance held in only 9 percent, 7 percent and 29 percent of the studies, respectively. Also, per pupil expenditures was positive and significant in 20 percent of the studies which used the measure.

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[2]70 percent of the studies measured school performance with a standardized test of some form, while the remaining studies used either dropout rate, college continuation, attitudes or performance after school.

In conclusion, Hanushek claims family background, as well as characteristics of peers and other students, are very important in determining student achievement. According to Hanushek, the most successful input measure is the performance of teachers on verbal ability tests, "but even there the evidence is not that strong (Hanushek, p.48)." He cites the importance of skill in teaching, while acknowledging the difficulties in measuring differences in teaching abilities. Hanushek warns against indiscriminate spending on facilities and teacher's salaries, as a proportionate growth in student performance may not result.

Hanushek offers an alternative position, commenting on studies which examine "input" measures of school quality, such as expenditures per pupil and the inconsistent results. Policy considerations suggest careful examination of education studies and their relevance to individual school systems. From his work, one concludes elements other than "input" measures may influence school quality, for example school size as reviewed below.

A lively debate surrounds the discussion of the size of high school and educational quality. The traditional view encouraged consolidation of rural schools to achieve size economies, as well as specialization and diversification (Welch, 1966). Others are concerned with the distributional effects of increasing high school attendance. Better students may benefit from increased academic and social opportunities, while marginal students may become alienated and receive less attention from teachers and administrators. Barker and Gump (1964) discuss the dichotomy of

large organization more easily allows for the development of noncontributors and of over-dominating "active" members. Summers and Wolfe (1977) find that low-achieving students performed worse on achievement tests in classes larger than 28 students, while high-achieving students did better. This supports the concept of the distributional impacts of classroom size as well as school size.

High school size measures more the process or the environment in which a student learns than its being a direct input into their education. The inclusion of high school size may reveal interesting results about public schools in the Commonwealth, as school divisions under pressure to consolidate high schools, unfortunately in turn may alienate at-risk students from educational attainment.

2.5 Global and Community Influences on Education Decisions

Combining the concepts of human capital, job signaling, rational underinvestment and school quality theory begins to describe a relationship between the level of community economic development and education decisions. The purpose of this study is to explore a framework which captures the changes occurring in the global market and to determine the role these changes play in influencing educational attainment. Figure 5 demonstrates global and community levels of influences on education decisions at the individual level. This is a conceptual foundation for the empirical model which is developed in Chapter 3.

The global economic restructuring trends discussed previously affect local

The global economic restructuring trends discussed previously affect local demand for skilled or unskilled labor. The figure describes a hierarchy of factors, from global to individual, that influence educational decisions. Global factors, such as trends towards free market trade and growth in the demand for skilled labor, affect communities differently. At the community level, past and present industry mix, resources and infrastructure play a role in influencing local demand for skilled labor. Also, past and present skill levels, earnings, value of education and school quality impact local demand for skilled labor. Other factors such as the probability of getting a job, as well as the availability of jobs in the local labor market are important. Together these incentives encourage/discourage individual educational attainment.

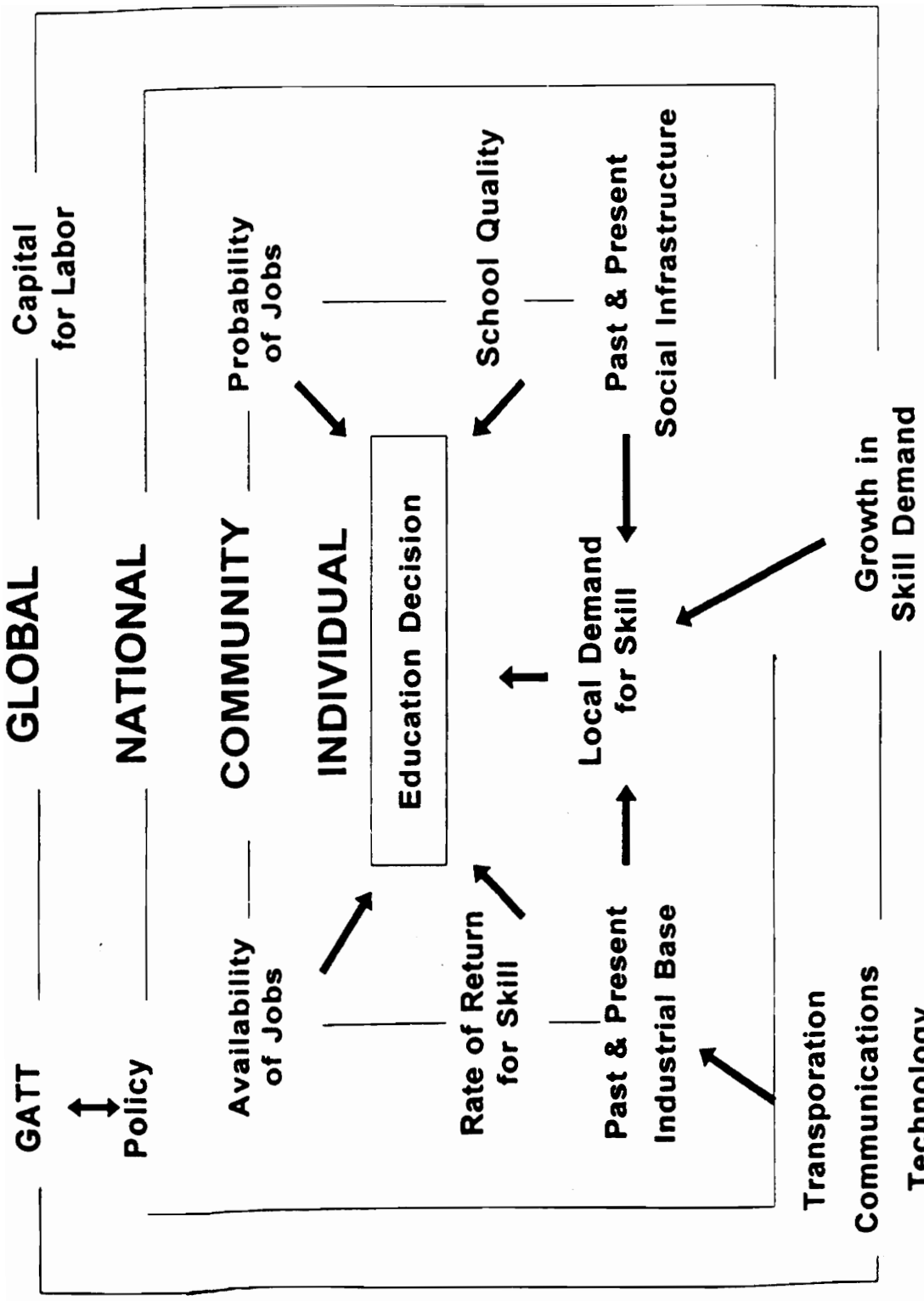

Figure 5 Global and Community Influences on Education Decisions

CHAPTER III

AN EMPIRICAL MODEL OF EDUCATIONAL DECISIONS

This study examines the influence of local employment opportunities on the decisions that high school students make concerning educational attainment. While Schultz and Becker hypothesize that individuals make human capital investment decisions in terms of potential life-long earnings, this study hypothesizes that the life-returns perception, and thus that the investment decisions, are influenced by economic signals at the community level. Communities with positive economic signals, measured by the quality of occupations available, employment growth and the likelihood of finding a job are hypothesized to have higher levels of educational attainment.

Alternatively, communities with low levels of economic opportunity, such as a predominance of low-skilled occupations, little job creation and a high unemployment percentage, will have lower levels of educational attainment. Quality schooling may work with or against

economic incentives of the local economy: if an individual attends school in a district with little economic opportunity and the quality of schooling is high, the quality of schooling may offset the negative economic signals the student receives. Therefore, the individual may choose to remain in high school or continue schooling after graduation although local economic signals were poor.

3.1 Variables

The following variables appear in the linear multivariate regression: occupational mix, percent unemployed, the percentage change in total employment, percentage of families in poverty, percentage of students in private education, per pupil expenditures, student-teacher ratio and the size of the largest high school in the district. The dependent variables are measures of educational attainment: dropout percentage and percentage of graduates continuing to post-secondary schooling. Following is a definition of each variable, expectations of the influence of the independent variable on the dependent variables as well as descriptive statistics.

Educational Attainment

The dependent variables are measures of individuals' decisions regarding educational attainment, either positive or negative. The dependent variables are 1) dropout percentages, a negative measure of educational attainment, and 2) percentage of the graduating class pursuing postsecondary education, a positive measure of educational attainment. The use of postsecondary education percentage and dropout percentage captures either the willingness of the student to invest in post-secondary schooling or not to invest in a high school diploma, respectively. Carter

(1971) suggests the use of degree-specific measures of educational attainment, such as the completion of high school, due to the existence of peaks at degree-specific periods[1]. Killian and Parker (1991) and Stallmann, et al. (1993) follow a similar pattern of using local dropout percentages and the percentage of graduates continuing on to further education to represent two measures on the educational attainment spectrum. Since the focus of this model is on high school student decisions, the percentage of high school graduates continuing on to further education and the dropout percentage are more precise measures than, for example, average years of school completed for the adult population. Educational attainment decisions represent the decision-making process facing high school students.

The measures of educational attainment are not mirror images of one another; the dropout percentage and postsecondary education percentages capture two different populations within the public school system. Potential dropouts are not likely candidates to also continue to postsecondary education and students who have the opportunity to continue their education beyond high school will not have dropped out. The annual dropout percentage is calculated by determining the number of students who stopped attending school during the academic year and/or did not return the following calendar year for reasons other than migration. That figure is then divided by the enrollment in the specified grades and the resulting figure is multiplied by 100. Before the 1988/89 school year, the dropout percentage was calculated for grades 8 through 12. Beginning with the 1988/89 school year, the dropout percentage included grades 7 through 12. Postsecondary education is collected by a survey of the graduating class and is measured by

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[1] For example, he finds an average schooling of 9.85 years in 1963, with a standard deviation of 3.92. Due to the large deviation, the Carter suggests the appropriateness of degree-specific measures of educational attainment.

those students who indicate their plans to continue in a vocational, two-year or four-year school.

Table 3.1 presents descriptive statistics of the educational attainment variables. The average dropout percentage increased from 4.70 percent in 1970 to 5.25 percent in 1980. Also, the minimum value increased from 0.80 percent in 1970 to 1.60 percent in 1980, while the maximum value of the dropout percentage jumped from 8.7 percent in 1970 to 15.8 percent in 1980. The data for 1990 are not comparable with the earlier data because of the definition change in 1988 (the 1990 data includes grades 7-12). The average postsecondary education percentage score was the lowest in 1980 at 51.9 percent, while the mean score was 54.52 percent in 1970 and 71.38 percent in 1990. Although the score dipped in 1980, postsecondary education percentages have increased substantially (24 percent) from 1970 to 1990. This suggests that students see the benefits to education and are increasingly investing in education beyond high school.

Variable Name	N	Mean	Standard Deviation	Minimum Value	Maximum Value
Dropout Rate, 1970	134	4.70	1.64	0.80	8.7
Dropout Rate, 1980	136	5.25	2.00	1.60	15.8
Dropout Rate, 1990	136	3.35	1.48	0.00	8.3
Continuing Education, 1970	134	54.52	12.38	24.0	83.0
Continuing Education, 1980	136	51.93	12.93	26.0	80.0
Continuing Education, 1990	136	71.38	12.43	40.0	94.0

Table 3.1 Descriptive statistics of educational attainment variables

* The dropout percentage for 1990 is calculated for grades 7-12, while the dropout percentage for 1970 and 1980 use grades 8-12. Therefore, this measure should not be compared across time periods.

Occupational Mix

Occupational mix is included to describe employment opportunities in the local labor market available to high school students. Robert Reich's (1991) framework is used to classify the U.S. Census occupations into new categories. Also, the occupational mix differentiates between skilled and non-skilled labor. For example, symbolic analysts represent skilled labor demand; it is assumed that jobs which require more education are more skill-intensive and of higher quality. As in-person service providers are the broadest category, the occupation has been divided into high and low-skill categories, according to the average national schooling level of the occupations. This division incorporates the quality of the service occupations.

The Standard Occupational Classification Manual, 1980, issued by the U.S. Department of Commerce, indexes and defines occupations. U.S. Commerce-defined occupations are matched according to the descriptions Reich provides in the Work of Nations. The fit is not always optimal due to aggregations in the Commerce data, but overall it is consistent with Reich's framework. For this study, symbolic analysts consist of engineers; natural scientists; other professional specialties; administrative and managerial occupations; and sales supervisors (as defined by the Department of Commerce). Table 3.2 shows the level of educational attainment of symbolic analysts in 1980 measured by less than a high school diploma and by more than 4 years of college.

OCCUPATION	% with less than High School	% with more than 4 years of College
Engineers	2.2	33.8
Natural Scientists	2.3	78.5
Other Professional Specialists	5.5	67.5
Administrative & Managerial	8.6	91.4
Sales Supervisors	17	17.7

Table 3.2 Symbolic Analysts and Education, U.S., 1980

Table 3.3 presents the distribution of educational attainment for routine producers in 1980 who include workers in precision production, construction trades, extractive activities, fabrication, assembly, inspection, machine operation, and farm worker and related occupations.

OCCUPATION	% with less than High School	% with more than 4 years of College
Precision Production	28.6	7.3
Construction Trades	32.7	5.2
Extractive	37.4	5.6
Fabricators, Assemblers, Inspectors	38.1	2.4
Machine Operators	43.9	2.2
Farm Workers & Related	50.7	4.8

Table 3.3 Routine Producers and Education, U.S., 1980

OCCUPATION	% with less than High School	% with more than 4 years of College
Low-Skill	-	-
Private Household Workers	61.1%	2.9%
Cleaning and Building Service	51.1	2.6
Material Moving Equipment Operators	43.9	1.9
Handlers, Equipment Cleaners, Helpers and Laborers	42.8	2.6
Motor Vehicles Operators	40	2.8
Food Service	37.6	4.0
Mechanics & Repairers	29.3	3.1
Rail & Water Operators	26.4	5.4
Other Personal & Health	26	6.3
Other Sales	22	7.3
High-Skill	-	-
Protective Service	18.4	11.6
Mail and Message	16.4	6.6
Other Administrative	11.1	4.0
Financial Records	8.7	8.9
Sales Representatives	7.7	33.5
Health Technologists	7.6	19.3
Other Technologists	6.2	28.2
Computer Equipment Operators	5.9	10.9
Health Assessment & Treating	2.8	41.7
Teachers, Librarians, & Counselors	2.1	82.1
Health Diagnosing	0.5	95.8

Table 3.4 Service Occupations and Education, U.S., 1980

High-skill services include health diagnosers; teachers, librarians and counselors, health assessment and treating workers; computer equipment operators, technologists, and others; health technologists; sales representatives; financial record keepers; other administrators; mail and message workers; and protective service personnel. Low-skill services include other sales; other personal and health services; rail and water operators, mechanics and repairers; food service workers; motor vehicle operators; handlers, equipment cleaners, helpers and laborers; material moving equipment operators; cleaning and building service; and private household. Table 3.4 presents all of the service occupations and respective educational attainment percentages for the U.S. in 1980.

The variables used in the regression are the share each occupational category has of total employment in the area for 1970 and 1980. In 1990, the data include employed as well as unemployed workers, therefore, the civilian labor force (which includes employed and unemployed workers) is used as the denominator. Table 3.5 shows a summary of the descriptive statistics for all of the occupational variables used in the study. The percentage of the total employment omitted from this analysis are 3.0, 2.8, and 2.5 percent for 1970, 1980 and 1990 respectively and consist principally of self-employed resource producers, Reich's fourth occupational category.

Variable Name	N	Mean	Standard Deviation	Minimum Value	Maximum Value
% Symbolic Analysts, 1970	134	13.07	5.85	3.27	35.01
% Symbolic Analysts, 1980	136	13.84	5.58	6.17	38.37
% Symbolic Analysts, 1990	136	16.98	7.24	8.03	47.83
% High-Skill Services, 1970	134	25.74	7.93	10.98	46.51
% High-Skill Services, 1980	136	27.41	6.89	11.31	42.26
% High-Skill Services, 1990	136	21.97	4.29	13.92	33.07
% Low-Skill Services, 1970	134	24.85	5.91	10.75	51.76
% Low-Skill Services, 1980	136	31.83	5.33	16.09	44.75
% Low-Skill Services, 1990	136	37.19	4.97	22.22	49.50
% Routine Producers, 1970	134	33.32	10.17	8.04	54.39
% Routine Producers, 1980	136	24.14	8.20	5.77	43.96
% Routine Producers, 1990	136	21.40	7.68	4.74	38.99

Table 3.5 Descriptive statistics of occupational variables for school districts

The mean for the percentage of symbolic analysts in each school district increases from 13.1 percent in 1970 to 17.0 percent in 1990. The mean for the percentage high-skill service occupations shows an increase from 25.7 percent in 1970 to 27.4 in 1980 and a subsequent decline to 22.0 percent in 1990. A decrease in the percentage high-skill services is also suggested by the decline in the maximum value from 46.5% in 1970 to 33.1% in 1990. The mean for the percentage of low-skill service occupations also increases from 24.9% in 1970 to

37.2% in 1990, an increase of 50 percent across the two decades. Also, the mean of the percentage routine producers decreases across the time period, from 33.3 percent in 1970 to 21.4 percent in 1990.

The occupations, as descriptors of local employment opportunity, are expected to influence two different education decisions. Low-skill-service and routine-production occupations are assumed to be low-quality jobs (and a measure of little economic opportunity); therefore, it is hypothesized that the two occupations will positively contribute to the dropout rate, a negative measure of educational attainment. On the other hand, high-skill service occupations and symbolic analysts represent high-quality jobs (and a measure of economic opportunity) and the occupations are expected to positively influence postsecondary education, a positive measure of educational attainment.

Unemployment percentage and percentage change in total employment

The availability and probability of finding a job is an important component in the search for employment. If individuals face a low probability of finding a job, i.e., high unemployment, and there are few available jobs for which they now qualify, i.e., little job creation, then they are more likely to remain in school. The opportunity cost of schooling falls as the individual is less likely to find employment. Therefore, the unemployment percentage is entered to account for short-term fluctuations in employment opportunities in the local area. It is expected that unemployment percentages will have a negative relationship with dropout percentages and a positive influence on postsecondary education, as the opportunity cost of remaining in school is lower in times of high unemployment.

Measuring long-term fluctuations in local economic opportunity, the percentage change in total employment is the net number of jobs which are created or destroyed within the past ten years. This assumes that if the local economy is creating jobs one has a higher probability of finding a job. The variable for 1990 is calculated by subtracting total employment in 1990 from total employment in 1980 and dividing by total employment in 1980. Total employment, as reported here, measures the number of residents of the school district with jobs and not the number of jobs in the school district (Bureau of the Census). Table 3.6 overviews descriptive statistics for total employment and unemployment percentages.

Variable Name	N	Mean	Standard Deviation	Minimum Value	Maximum Value
Unemployment Rate, 1970	134	3.33	1.69	.7	12.4
Unemployment Rate, 1980	136	5.63	1.85	2.1	10.6
Unemployment Rate, 1990	136	5.14	2.26	1.1	13.8
Job Creation, 1960-1970	134	12.22	17.49	-64.09	55.54
Job Creation, 1970-1980	134	21.74	14.65	-21.36	58.44
Job Creation, 1980-1990	136	12.63	14.98	-27.84	51.60

Table 3.6 Descriptive statistics of unemployment rate, total employment and job creation for school districts

The one hypothesized relationship is a negative influence of change in total employment on the dropout percentage and a positive influence on postsecondary education. Gains in total employment over the long-term will encourage educational attainment while declines in the size of the employed labor force over ten years will discourage educational attainment. On the other hand, a positive relationship may exist with the dropout percentage and a negative relationship

may exist with postsecondary education percentages. The opportunity cost of foregoing present employment opportunities (or lack there of) may also encourage students to enter the labor market (or to continue in school).

Percentage of families in poverty:

The percentage of families in poverty describes the socio-economic circumstances of families in the community. Poor families face more constraints in providing educational services within the home and are less likely to have experienced the benefits of education. Poverty percentages are a traditional measure of the at-home environment and have consistently been shown to influence educational attainment decisions (Stallmann, 1994; Rural Sociological Society Task Force on Poverty, 1991). Also, the percentage of families in poverty is a proxy for the social and physical capital available in the community. Communities with higher levels of poverty have lower levels of resources with which to invest in public services, such as education.

Table 3.7 presents the descriptive statistics for the percentage of families in poverty. It is expected that the percentage of families in poverty will have a positive relationship with dropout percentages and a negative relationship with postsecondary education percentages. As the percentage of families in poverty rises, the level of educational attainment is hypothesized to fall.

Variable Name	N	Mean	Standard Deviation	Minimum Value	Maximum Value
% Families in Poverty, 1970	134	16.6	7.6	3.2	39.5
% Families in Poverty, 1980	136	10.62	4.17	1.7	21.3
% Families in Poverty, 1990	136	9.80	5.05	1.8	25.3

Table 3.7 Descriptive statistics of families in poverty for school districts

Percentage of students in private schools:

Given the history of private education in Virginia and the rise of private academies following integration in the late 1950's, it is important to examine the relationships between the percentage of students in private schools and educational attainment. Private schools are able to attract (or are self-selected by) many better than average students. At-risk students, those more likely to end up with low educational attainment, remain in the public system. Also, those families in a school district who place a high value on education may be more likely to send their children to private schools. Therefore, the students who may be more at-risk remain in the public system. Table 3.8 summarizes the descriptive statistics for the percentage of total students in the public school district who attend private schools. The data for 1970 and 1980 includes only high school students, while the 1990 data is only available with both elementary and high school students.

It is expected that the percentage of student in private education will have a positive influence on the dropout rate and a negative influence on the postsecondary education percentages.

Student-Teacher Ratio and Per Pupil Expenditures

School quality is important to consider as it influences student earnings in the labor market, in that higher school quality leads to higher earnings. Although described earlier as imperfect measures, per pupil expenditures and student-teacher ratio are the most traditional and readily available measures. Student-teacher ratio is a measure of the number of students in each classroom and therefore a proxy for the attention students receive from their teachers. Expenditures per pupil captures the monetary resources invested in each student within the school district. Also, expenditures per pupil indicates communities which value education and are willing to have a higher tax base to support the public schools. Some studies, discussed in Chapter 2.4, have found relationships between these school quality variables (student-teacher ratio and per pupil expenditures) and subsequent earnings/wages and others have found little relationship (Morgan and Sirageldin, 1968; Johnson and Stafford, 1973; Rizzuto and Wachtel, 1980; Card and Krueger, 1992; Hanushek, 1989).

The values for expenditures per pupil are in real 1990 dollars. Table 3.8 presents the descriptive statistics for per pupil expenditures and student-teacher ratio. A student-teacher ratio is hypothesized to be positively associated with dropout percentages and negatively associated with postsecondary education percentages. Also, it is expected that per student spending is negatively related to dropout percentages and positively related to postsecondary education.

Size of School:

The traditional view of school sizing encourages consolidation of rural schools to achieve size economies, as well as specialization and diversification (Welch, 1966). Other

perspectives are concerned with the distributional effects of increasing high school attendance. Better students may benefit from increased academic and social opportunities, while marginal students may become alienated and receive less attention from teachers and administrators. Barker and Gump (1964) discuss the dichotomy of size, in that a small organization often pressures each member to participate, while a large organization more easily allows for the development of noncontributors and of over-dominating "active" members. Summers and Wolfe (1977) find that low-achieving students performed worse on achievement tests in classes larger than 28 students, while high-achieving students did better. This supports the concept of the distributional impacts of classroom size as well as school size.

These results suggest that large high schools are valuable to students planning to continue to post-secondary schools with respect to the diversity of courses offered and teacher-specialization available. Small high schools are important for at-risk students, who need the additional attention afforded by involvement in extracurricular activities and attention from teachers and administrators.

Data for the 1980 school year are unavailable from the Virginia Department of Education, therefore the variable for 1980 was calculated by averaging the size of the largest high school in 1970 with that of 1990. Table 3.8 shows the descriptive statistics for the size of the largest high school in the school district. A positive relationship between school size and both postsecondary education and dropout percentage is expected.

Variable Name	N	Mean	Standard Deviation	Minimum Value	Maximum Value
Student-Teacher Ratio, 1970	134	18.63	1.90	12.91	23.08
Student-Teacher Ratio, 1980	136	13.95	1.53	9.7	18.7
Student-Teacher Ratio, 1990	136	11.71	2.21	6.7	19.0
Per Pupil Expenditures, 1970	134	2251	392.52	1762	4440
Per Pupil Expenditures, 1980	136	3155	656.71	2336	6433
Per Pupil Expenditures, 1990	136	4812	892.49	3807	8724
% in Private Education, 1970	134	4.6	6.7	.05	42.1
% in Private Education, 1980	136	5.6	4.8	.06	21.7
% in Private Education, 1990	136	5.9	3.8	.50	19.8
Largest High School, 1970	134	1018	571.07	218	2994
Largest High School, 1980	136	987	544.24	174.5	3063
Largest High School, 1990	136	949	567.07	131	3132

Table 3.8 Descriptive statistics of school quality measures

3.2 Model

Presented below are the two regression equations which are estimated using an ordinary-least squares (OLS) estimation procedure (Gujarati, 1988; Maddala, 1992). Model 1 uses dropout percentage as a dependent variable and Model 2 has postsecondary education as a dependent variable. Model 1 includes routine producers and low-skill service occupations since these variables are hypothesized to positively influence the high school dropout percentage. As these occupations require lower levels of skills, an influence on the dropout percentage is expected. It follows:

$$Y = \alpha_0 + \alpha_1 X1 + \alpha_2 X2 + \alpha_3 X3 + \alpha_4 X4 + \alpha_5 X5 + \alpha_6 X6 + \alpha_7 X7 + \alpha_8 X8 + \alpha_9 X9 + U;$$

where;

Y = Dropout percentage
X1 = Percentage employment in routine producers occupations
X2 = Percentage employment in low-skill service occupation
X3 = Unemployment percentage
X4 = Percentage change in total employment over ten years
X5 = Percentage of families in poverty
X6 = Percentage of students in private education
X7 = Per pupil expenditures
X8 = Student-teacher ratio
X9 = Size of the largest high school
U = Unexplained variance

The independent variables in model 2 include the important signals weighed by a student considering postsecondary education, two of which are percentage of symbolic analysts and percentage of high-skill service occupations. Since these occupations have higher levels of skills, it is hypothesized that they will encourage higher levels of educational attainment, measured by postsecondary education. The model is:

$$Y = \alpha_0 + \alpha_1 X1 + \alpha_2 X2 + \alpha_3 X3 + \alpha_4 X4 + \alpha_5 X5 + \alpha_6 X6 + \alpha_7 X7 + \alpha_8 X8 + \alpha_9 X9 + U;$$

where;
Y = Percentage of students in postsecondary education
X1 = Percentage employment in symbolic analysts occupations
X2 = Percentage employment in high-skill service occupation
X3 = Unemployment percentage
X4 = Percentage change in total employment over ten years
X5 = Percentage of families in poverty
X6 = Percentage of students in private education
X7 = Per pupil expenditures
X8 = Student-teacher ratio
X9 = Size of the largest high school
U = Unexplained variance

3.3 Data

The data are collected from Facing-Up, a publication from the Department of Education for the Commonwealth of Virginia and from the Population Census, Bureau of the Census, United States Government. The unit of analysis is the school district (or school division as it is called in Virginia), as the school system information is provided at that level. School districts in Virginia generally coincide with counties and independent cities, although occasionally are a consolidation of the two political units. Figure 3.1 shows the counties and independent cities in Virginia. Norfolk County and South Norfolk City consolidated into Chesapeake City in 1963 and Virginia Beach City incorporated Princess Anne County in the same year. The 1960 census data are aggregated for Chesapeake and Virginia Beach Cities to accommodate the more recent political boundaries. Nansemond County consolidated with Suffolk City in 1974, therefore, 1960 and 1970 census information and 1970 school system data combine Nansemond County with Suffolk City. Also, Manassas City and Manassas Park City became independent from Prince William County in 1975 and are therefore not in the data set for 1960 or 1970. Census and school system data are reported independently in 1980 and 1990 for both cities.

In 1970, the following counties had joint school systems with an adjacent independent city: Bedford County included Bedford City, Fairfax County included Fairfax City, Greensville County included Emporia City, Halifax County included South Boston City, Prince William County included Manassas City and Manassas Park City, and Roanoke County included Salem City. Alternatively, the school system for Williamsburg City included James City County. The reporting was similar for 1980 except for the following changes: Manassas City and Manassas Park City were reported separately from Prince William County data and Rockbridge County included Lexington City, which were reported separately in 1970. In 1990, only one change

occurred: Clifton Forge City was reported with Allegheny County.

Some towns in Virginia maintained separate school systems within the county. Since Census data were available only at the county and independent city level, these school system data for these towns were combined with the data for the county. In 1970, the independent town school districts were Abingdon, Cape Charles, Colonial Beach, Fries, Saltville and West Point, which were combined with Washington, Northampton, Westmoreland, Grayson, Smyth and King William County, respectively. In 1980, only Cape Charles, Colonial Beach, Fries and West Point were reported as separate town school districts. In 1990, only Colonial Beach and West Point maintained separate school districts.

CHAPTER IV

RESULTS

Table 4.1 presents the regression results from the models with dropout percentage as the dependent variable. Table 4.2 presents the equations with post-secondary education as the dependent variable.

Results for the Dropout Percentage Regressions

In 1990, both routine producers and low-skill service occupations as a proportion of total employment are positively and significantly related to the dropout percentage as expected; thus, consistent with the hypothesis, low-skill occupations discourage educational attainment. The insignificance of the relationships in 1970 and 1980 suggest the increasing relevance of Reich's occupational definitions over time. The increasing significance of Reich's occupations as time advances from 1970 to 1990 supports the hypothesis of the increasing importance of skill considerations in the labor market and as demonstrated by these occupational categories' relationship to educational attainment

decisions.

The percentage change in total employment is positively and significantly related to dropout percentage in 1990, while the relationship is negative and significant in 1970. As increasing total employment is also an increasing availability of jobs, this variable represents opportunities for the student in the local labor market. In 1970, the sign was negative, suggesting that the availability of jobs in the local labor market encouraged students to remain in high school. Perhaps young people in growing communities were more optimistic about the future likelihood of good jobs; they were willing to delay working until they completed high school on the assumption that would bring them better employment. The positive sign in 1990 is interpreted as the local labor market did not reward completion of high school or that young people were less optimistic about future employment opportunities. Therefore, students choose to dropout from high school and begin working today rather than forego earnings to finish high school.

Unemployment is unrelated to dropout percentages for 1970, 1980 and 1990. The inclusion of the unemployment percentage was to capture short-term fluctuations in the probability of finding a job. As the variable is not significant in any of the time periods, perhaps a lag-period of one to two years is needed before the information reaches the student.

The family poverty rate in 1970 and 1980 is positive and significant and in 1990, the poverty rate becomes insignificant. The purpose of the family poverty rate, which is validated in 1970 and 1980 but not in 1990, suggests that the overall socio-economic

background of students no longer has an influence on the dropout rate. Private school attendance is positive and significant in all three years, supporting the hypothesis that poorer school quality or poorer students in the public system result from higher percentages of students in private schools.

Student-teacher ratio is significant in 1970 and 1980, although positive in the former and negative in the latter. These results are unexpected and difficult to explain. Expenditures per pupil is not significant in any of the years. In 1970, 1980 and 1990, the size of the largest high school is positively related to the dropout percentage of the school district and is significant. This finding is supported by the literature, which suggests that larger schools are harmful to at-risk students. As larger schools alienate at-risk students from the education process and discourage educational attainment, as measured by the dropout percentage.

VARIABLE	COEFFICIENT	STANDARD DEVIATION	T-STATISTIC	PROBABILITY
% Routine Producers, 1990	.0557*	.0216	2.582	.0110
% Routine Producers, 1980	.0252	.0244	1.034	.3031
% Routine Producers, 1970	.0083	.0205	0.405	.6859
% Low-Skill Service, 1990	.1606*	.0032	5.050	.0001
% Low-Skill Service, 1980	.0536	.0364	1.476	.1426
% Low-Skill Service, 1970	.0305	.0301	1.013	.3132
CHG Total Employment, 1990	1.973*	1.168	1.690	.0936
CHG Total Employment, 1980	0.785	1.056	0.743	.4590
CHG Total Employment, 1970	-2.042*	0.872	-2.341	.0208
Unemployment %, 1990	.0904	.0903	0.368	.7138
Unemployment %, 1980	.0496	.0989	0.502	.6164
Unemployment %, 1970	-.0093	.0774	-0.120	.9047
% of Families in Poverty, 1990	.0421	.0438	0.962	.3380
% of Families in Poverty, 1980	.2230*	.0458	4.870	.0001
% of Families in Poverty, 1970	.0921*	.0268	3.443	.0008
% in Private High School, 1990	.0646*	.0358	1.803	.0739
% in Private High School, 1980	.1007*	.0346	2.908	.0043
% in Private High School, 1970	.0570*	.0210	2.708	.0077
Student-Teacher Ratio, 1990	-.0805	.0712	-1.121	.2644
Student-Teacher Ratio, 1980	-.4156*	.1023	-4.061	.0001
Student-Teacher Ratio, 1970	.1715*	.0783	2.191	.0303
Expenditures per Pupil, 1990	-.0002	.0002	-0.994	.3220
Expenditures per Pupil, 1980	-.0001	.0003	-0.342	.7330
Expenditures per Pupil, 1970	-.0003	.0005	-0.563	.5744
Largest High School, 1990	.0009*	.0003	3.597	.0005
Largest High School, 1980	.0016*	.0003	5.095	.0001
Largest High School, 1970	.0005*	.0003	1.773	.0788
Year	Adjusted R2	F-Value	Prob>F	
1990	25.52	6.025	.0001	
1980	39.01	10.381	.0001	
1970	34.91	8.867	.0001	

Table 4.1 Regression Results for Dropout Percentage (1990,1980,1970)

Results for the Post-Secondary Education Percentage Regressions

A large proportion of high-skill service occupations had a positive and significant relationship to post-secondary education in 1980 and 1990, while symbolic analysts are positive and significant only in 1990. Again, the Reich framework is only significant in 1990 for both occupations, suggesting the growing relevance of the Reich framework. As symbolic analysts become more important in local and national economies, the occupations increasingly are relevant to post-secondary education decisions.

The percentage change in total employment is significant and negatively related to post-secondary education percentages in 1980 and 1990. Consistent with the dropout percentage equations, students in local labor markets with a growing number of jobs choose to forego further education and to pursue current employment opportunities. The perceived opportunity cost of post-secondary education is significantly greater in growing communities than in those experiencing a decline in total employment. The unemployment percentage is not significantly related to post-secondary decisions in the three time periods.

Only in 1970 is the poverty rate of families significant and it is negatively related to post-secondary education, suggesting that areas with high levels of poverty in 1980 and 1990 did not also have lower percentages of post-secondary education. The percentage of students in private schools is negative and significant for 1990, while insignificant for 1970 and 1980. Also, consistent with the hypothesis, the higher percentage of students

in private schools coincides with lower percentages of post-secondary education, a measure of low educational attainment.

Student-teacher ratio or expenditures per pupil are not significantly related to the post-secondary percentage for any of the years. These results are unexpected and may result from lag-periods associated with these variables' impact on change in the student-teacher ratio or expenditures per pupil. The size of the largest high school in the school district has a significant and positive impact on pursuit of post-secondary studies in 1980 and 1990. Larger high schools, as suggested by the literature, provide more opportunities for stronger students, and which is reflected in higher post-secondary education percentages.

VARIABLE	COEFFICIENT	STANDARD DEVIATION	T-STATISTIC	PROBABILITY
% Symbolic Analysts, 1990	.0065*	.0026	2.523	.0129
% Symbolic Analysts, 1980	.0049	.0033	1.523	.1302
% Symbolic Analysts, 1970	.0044	.0030	1.464	.1457
% High-Skill Services, 1990	.0090*	.0030	2.989	.0034
% High-Skill Services, 1980	.0061*	.0019	3.152	.0020
% High-Skill Services, 1970	.0021	.0021	1.014	.3128
CHG Total Employment, 1990	-.2779*	.0935	-2.973	.0035
CHG Total Employment, 1980	-.2411*	.0632	-3.814	.0002
CHG Total Employment, 1970	-.0878	.0652	-1.346	.1809
Unemployment %, 1990	-.0079	.0067	-1.189	.2369
Unemployment %, 1980	.0010	.0056	0.185	.8535
Unemployment %, 1970	.0082	.0057	1.445	.1509
% of Families in Poverty, 1990	.0018	.0036	0.498	.6195
% of Families in Poverty, 1980	.0013	.0029	0.467	.6414
% of Families in Poverty, 1970	-.0061*	.0020	-3.050	.0028
% in Private High School, 1990	-.0046*	.0028	-1.642	.1032
% in Private High School, 1980	-.0004	.0020	-0.227	.8206
% in Private High School, 1970	-.0008	.0015	-0.509	.6614
Student-Teacher Ratio, 1990	-.0025	.0059	-0.422	.6736
Student-Teacher Ratio, 1980	.0003	.0063	0.039	.9686
Student-Teacher Ratio, 1970	-.0053	.0057	-0.914	.3626
Per Pupil Expenditures, 1990	$-.29X10^{-5}$	$.16X10^{-5}$	-0.177	.8599
Per Pupil Expenditures, 1980	$.14X10^{-5}$	$.20X10^{-5}$	0.068	.9457
Per Pupil Expenditures, 1970	$.11X10^{-4}$	$.36X10^{-4}$	-0.303	.7622
Largest High School, 1990	$.40X10^{-4}$*	$.21X10^{-4}$	1.939	.0547
Largest High School, 1980	$.65X10^{-4}$*	$.20X10^{-4}$	3.272	.0014
Largest High School, 1970	$.34X10^{-4}$	$.21X10^{-4}$	1.608	.1104
Year	Adjusted R2	F-Value	Prob>F	
1990	31.29	7.680	.0001	
1980	46.82	13.912	.0001	
1970	37.89	9.949	.0001	

Table 4.2 Regression Results for Post-Secondary Education Percentages (1990,1980,1970)

The regression results for model 2 are stronger than the results for model 1. Model 2 has a better fit, perhaps due to the more homogenous population that chooses to continue their education beyond high school as contrasted with the more heterogenous group that drops out from high school. The adjusted R^2 for model 2 ranges from 31.29 in 1990 to 46.82 in 1980 while the adjusted R^2 for model 1 is lowest at 25.52 in 1990 and is highest in 1980 at 39.01. For both models, the explanatory power is the highest in 1980, when the R^2 is 39.01 and 46.82 for model 1 and model 2, respectively.

Comparing the Two Models

Next, it is useful to compare results from the regressions as both dependent variables are measures of educational attainment, where post-secondary education is a positive measure and the dropout percentage is a negative measure. The zero-order correlations between the two variables are -.30 in 1970, -.10 in 1980 and -.21 in 1990. These low negative correlations are consistent with the expectation that the explanations of the two school attainment variables are quite different. The Reich framework is significant within the models for 1990, suggesting the growing relevance of these particular occupational groups over time. Of all the occupations, low-skill services in 1990 has the highest t-statistic, 5.050, when explaining the dependent variable, dropout percentage.

The percentage change in total employment is negative and significant in 1980 and 1990 for post-secondary education percentages, while the percentage change in total

employment is positive for dropout percentages in 1990 but negative in 1970. Areas with growing employment had higher dropout percentages in 1990 and lower dropout percentages in 1970. The regressions were rerun without the observations of Richmond and Norfolk, which are outlier with very high dropout percentages. The second set of results are consistent with the findings discussed above (with all observations) in that the sign and significance of each estimate does not change when the outlier are excluded.

The poverty rate is significant and positive for 1970 and 1980 for dropout percentage, while negative and significant in 1970 for post-secondary education percentages. As expected, school districts with high percentages of families in poverty have lower educational attainment. The analysis shows that the percentages of families in poverty, which is assumed to represent the socio-economic background of public school students, does not impact educational attainment decisions in 1990. An explanation for the change in significance in 1990 is difficult to explain.

The size of the largest high school is significant and positive for dropout percentage 1970, 1980 and 1990 and positive for post-secondary education percentages for 1980 and 1990. Again, this supports the hypothesis that while large high schools are beneficial to stronger students, large high schools are harmful to at-risk students.

Most interesting are the results for private schools. The private-school variable is significant and positive for dropout percentage in all three time periods and negative for post-secondary education percentages in 1990. Apparently, the drain of high student

quality from public school systems into private schools is a growing problem, as suggested by its significance in the 1990 post-secondary education equation (but on average it represents only 5 percent of students). The hypothesis that lower educational attainment, measured by low post-secondary education percentages and high dropout percentages, results from high percentages of private school enrollment due to the poorer quality of public school students has been confirmed. More research is needed to determine the mechanisms by which this occurs.

Inclusion of the Percentage of African-Americans

Regressions were also run which included the percentage of African-American within the school district. Due to the rise of private academies following integration of public schools in the late 1950's, private school enrollment could be a proxy for proportion of African-Americans in the school district and not directly affect the quality of the public schools or students. Regression results and descriptive statistics when African-Americans, ages 15-19, were added are displayed in Appendix A.

The percentage of African-American students contributes significantly and positively to the dropout percentage in 1970 and 1990, but the percentage of students enrolled in private schools remains significant and positive for 1970 and 1980 and positive and nearly significant in 1990. The African-American variable has the strongest impact on the dropout percentage, when in 1970 the adjusted R^2 increases as much as 3.01. The African-American variable contributes significantly only in 1990 to post-secondary

education percentages. The percentage of students in private school also remains significant and positive.

The fact that the African-American variable does not fully replace the effect of private school enrollment suggests that other related variables may be operating. A possible explanation is that private school index a certain lack of community cohesion or social capital (see Putnam, 1993 for a discussion of social capital), which in turn is reflected in a less desirable atmosphere in the public school system, ultimately leading to lower school attainment levels.

Correction for Collinearity Problems

While expenditures per pupil is never significant and the student-teacher ratio is significant and positive in 1970 and significant and negative in 1980, their contribution seems questionable. Also, diagnostic statistics suggest a multi-collinearity problem, as a condition index of over 30 pointed to these two variables (see Appendix B). Not until both variables are removed does the condition index fall under 30 for the post-secondary education equations (see Appendix B). For the dropout percentage, low-skill services is now positive and significant in 1980 and 1990, while the variable becomes collinear with the intercept in 1980 with a condition index of 31.7.

Performing the regressions without per pupil expenditures and student-teacher ratio alters the adjusted R^2 for the dropout percentage the most, suggesting that the two

variables contribute to the dropout percentage in some way[1]. The adjusted R^2 for the dropout percentage in chronological order is 24.52, 31.44 and 31.96 for the regressions without student-teacher ratio and per pupil expenditures. The most notable change is for 1980, where the adjusted R^2 drops by 7.57 points. For post-secondary education percentages, the adjusted R^2 in chronological order is 32.29, 47.67 and 38.47 for the regressions without these two variables.

Influence of the Type of Locality on the Models

Descriptive statistics suggest poorer economic indicators in nonmetropolitan areas than in metropolitan areas. Descriptive statistics of the data for each sample are presented in Appendix C. For 1970, the mean score of the dropout percentage for nonmetropolitan areas, 4.98, is higher than the state average, while the mean score for metropolitan areas, 4.22, is below the state average. For 1980 and 1990 the positions reverse, in that nonmetropolitan areas have a lower score, 5.07 and 3.31 respectively, than the state average and metropolitan areas have a higher mean score, 5.58 and 3.43 respectively. For post-secondary education percentages, nonmetropolitan areas consistently fall beneath the state average for all three time periods, while metropolitan areas have a higher mean percentage than the state average. For nonmetropolitan areas, the figures are 51.87%, 48.53% and 68.24% for the years 1970, 1980 and 1990 respectively. The post-secondary

[1] Expenditures per pupil is correlated with occupational variables as demonstrated by the positive correlations over time with symbolic analysts (.59 to .64) and with high-skill services (ranging from .25 to .52), and negative with routine producers (-.51 to -.60).

education percentages for metropolitan areas for 1970, 1980 and 1990 are 59.12%, 57.61% and 76.65%, respectively.

As nonmetropolitan areas lag behind in post-secondary education percentages, poorer employment opportunities also appear in these areas as compared to metropolitan areas. The average percentage of symbolic analysts and high-skill service occupations are consistently higher than the state average in metropolitan areas, while nonmetropolitan areas are consistently lower from 1970 to 1990. The reverse is true for the percentage of low-skill service occupations and routine producers. Nonmetropolitan areas for 1970, 1980 and 1990 have higher percentages of the two occupations than the state average, while metropolitan areas have lower percentages for each time period.

For each time period, nonmetropolitan areas have higher unemployment percentages and lower average percentage change in total employment than the state average. Metropolitan areas maintain lower unemployment percentages and higher percentage change in total employment averages than the state average for 1970, 1980 and 1990.

The average percentage of families in poverty is consistently lower than the state average in metropolitan areas, while nonmetropolitan averages are above the state average from 1970 to 1990. Metropolitan areas are above the state average for the percentage of students in private schools the largest high school and nonmetropolitan areas are beneath also in 1970, 1980 and 1990.

The measured proxies for school quality also appear to vary according to

metropolitan/nonmetropolitan location. Expenditures per pupil are consistently beneath the state average in nonmetropolitan areas, while higher for metropolitan areas. The student-teacher ratio does not vary from the state average for metropolitan and nonmetropolitan areas in 1970, 1980, or 1990. Metropolitan areas are above the state average for the size of the largest high school and nonmetropolitan areas are beneath also in 1970, 1980 and 1990.

To statistically test the importance of type of locality on educational attainment decisions, the Virginia population is separated into samples of metropolitan and non-metropolitan areas. The Chow test is used to find potential influences of the type of locality on the dependent variables. Metropolitan areas are classified as those with a 1983 Beale code of less than or equal to 3, while nonmetropolitan areas have a Beale code of greater than or equal to 4. The Chow test follows (Gujarati, 1988):

$$F = \frac{S_5/k}{S_4/(N_1+N_2-2k)}$$

F = Calculated F-statistic
N_1 = Number of metropolitan observations
N_2 = Number of nonmetropolitan observations
S_5 = Residual sum of squares (RSS) for the population regression
S_4 = Sum of RSS for the two sample regressions
k = Number of parameters estimated

DEPENDENT VARIABLE	F-STATISTIC
Dropout Rate, 1970	12.187
Dropout Rate, 1980	15.493
Dropout Rate, 1990	13.072
Continuing Education, 1970	11.874
Continuing Education, 1980	12.176
Continuing Education, 1990	12.618
Critical F-Statistic ≈ 1.65 (120,10), Prob $\geq .10$	

Table 4.3 Calculated F-Statistics using the Chow Test

As each calculated F-statistic is greater than the critical value, the hypothesis of an increased explanatory power from dividing the population is rejected. The models are most powerful when estimated as a population rather using metropolitan and non-metropolitan observations in separate regressions. Therefore, the conclusion is that place, measured as metropolitan or nonmetropolitan, does not provide additional predictive power to the base model. One explanation for this outcome may stem from market changes as suggested in Chapter 1. As transportation and communication technology develops, rural areas have become less isolated from and more woven with urban and suburban trends. Also, economic opportunity differences among metropolitan/nonmetropolitan communities are already reflected in the models.

CHAPTER V

CONCLUSIONS AND IMPLICATIONS

In order to adequately prepare future generations to compete in the global economy, human capital investments are vital. The role of educational attainment in determining growth and development into the twenty-first century is increasingly important. Educational attainment divergence among communities will lead to divergent opportunities in the future. Rural areas, which have lower post-secondary education percentages (a measure of positive educational attainment), are not well positioned for economic growth in the Reich framework; on the other hand, suburban areas, which have higher postsecondary education percentages, are better positioned to take advantage of economic opportunity.

Employment opportunities within a community send signals of optimism or pessimism to young members of the population, and are therefore a valuable consideration to education and economic development policymakers. Structural variables, which relate to the level of economic development in a community, are connected to global and

national trends and are difficult for communities to change. Communities must examine their opportunities and resources carefully for long-term planning, while recognizing that institutional variables such as school quality are more easily alterable in the short-run.

The role of public schools within the development process is important because it can be a point of intervention in a local economy which is on a downward spiral of low human capital and poor employment opportunities. The possibility of breaking this cycle is suggested in the literature by the trade-off between quantity and quality of education. In the long-run, communities must consider all policy options within the context of a strategic plan which incorporates the value of human capital in creating wealth and employment for the community's residents.

The general results of this study establish a relationship between local employment opportunities and educational attainment decisions of high school students in 1970, 1980 and 1990. The explanatory powers of the models range from twenty-five percent to forty percent over the time period. While the explanatory power is the lowest in 1990 at twenty-five percent, it is still a respectable relationship.

According to the Reich framework, symbolic analysts will tend to concentrate in specialized urban areas. Perhaps peripheral areas will therefore continue to struggle to acquire the economic incentives for educational attainment. Routine producers and symbolic analysts compete with other workers globally, while the fortunes of service providers are locally based. Symbolic analysts are the larger engine of growth, creating opportunities locally for in-person services providers and globally for routine goods

producers. Therefore, some regions will prosper, in that a large proportion of their work force are symbolic analysts which leads to a higher level of economic activity. Unfortunately, some regions also will fall behind as the high percentage of routine producers represents a declining economic base.

As demonstrated by the data, communities vary in educational attainment, as well as occupational structure. A pattern of association between postsecondary education percentages and symbolic analysts percentages is clear. Similarities in the distribution of dropout percentages and low-skill service percentages can also be found. Positive educational attainment, high postsecondary percentages, occurs where high-quality jobs can be found, while negative educational attainment, high dropout percentages, exists where low-quality jobs are present.

The findings of this study suggest the growing relevance of the occupational groupings developed by Robert Reich. The increasing statistical significance from 1970 to 1990 of the Reich-defined occupations suggests the growing importance of the framework. Increasingly, the kinds of employment opportunities, as defined by occupation, available to younger generations are relevant to their education decisions. The role that the quality of occupation plays will continue to become more important to human capital investment decisions.

Of particular importance to community planners is the growth of service occupations in local labor markets. The results demonstrate that low-skill service occupations contributed more to dropout percentages in 1990 than did routine production

jobs. The stronger relationship may be a result of the growing percentage of low-skill service occupations within local labor markets as the percentage of routine producer jobs shrink. In addition, routine production jobs are still seen as better jobs then low-skill service jobs.

Local and state governments must guard against the concentration of low-skill service occupations in local economies. Without strong growth in symbolic analyst occupations, service workers will continue to suffer from low wages and low-skill employment. High-skill service occupations and symbolic analysts positions must be targeted as these occupations create incentives for educational attainment and therefore lead to prosperous future generations. Careful consideration with respect to the quality of employment must to be given to the implications of job creation and industrial development.

As the works of Spence(1973) and Smith(1989) suggest, local employers send signals for human capital investment to future generations. Applying the Reich framework to communities within Virginia also demonstrates the growing importance of occupation in the role of economic development. The results of this study indicate that high proportions of low-skill occupations, such as routine producers and low-skill service providers, discourage human capital investment by contributing positively to the 1990 dropout percentage in Virginia. Negative educational attainment, measured by the dropout percentage, disadvantages communities in attracting quality employment.

On the other hand, the concentration of high-skill occupations, such as symbolic

analysts, encourages students to continue in school. Communities with high levels of educational stock, accumulated over time resulting from community-level signals encouraging human capital investment, face an economic future with more possibilities and opportunities. An interesting follow-up to this study would be to look at the role educational attainment plays in explaining the kinds of employment opportunities in the local labor market, as traditionally other studies have done.

As Hanushek (1989) suggests, traditional input measures are inconsistent predictors of educational outcomes. Within this study, the inclusion of expenditures per pupil and student-teacher ratio contributes little to the explanatory power of the empirical model. The size of the school and levels of private school attendance have the strongest influence among school quality variables on educational attainment in Virginia. The findings with respect to large school size are relevant to modern policy issues in Virginia. Rural consolidation of schools is often thought to be advantageous by offering more diversity to students, as well as trimming costs. However, the results of this study suggest that large high schools, while contributing positively to the postsecondary education rate, also contribute positively to dropout percentages. Perhaps the issue of consolidation of schools should be examined in more detail and with respect to all students, particularly those at risk. Information technologies, such as satellite teaching, could be beneficial in order to provide classroom diversity for stronger students, while affording smaller (noncosolidated) schools for at-risk students.

The strong relationship between public school dropout rates and the percentage of

students who are in private schools cannot readily be explained in strictly economic terms. Perhaps private school enrollment is a negative indicator of what Putnam calls "social capital." (Putnam, 1993; Flora and Flora, 1993). Private school enrollment is an indicator of social distance between or among groups in the community. That social distance may be based on race, class, or perhaps religious differences. It would appear to have a social impact on students, such that many who are in the public school system may have feelings of social inferiority or a feeling that it is impossible to get ahead in their community. Those feelings may be reinforced by actual discrimination against the group of students defined as socially inferior by teachers and administrators (Hollingshead, 1949). Clearly, analysis of secondary data at the school district level cannot explicate this relationship. There is a need for case studies to understand the relationship between public school dropout rates and private school enrollment.

Further study could include a more detailed examination of the relationship between community economic development, community social capital and the local school system in Virginia. Collection of primary data would allow for more flexibility and attention to describing the process of education at the local level.

In summary, the findings of this study support the hypothesis that local employment opportunities, described in part by the growing importance of the Reich framework, influence educational attainment. Although the results are not overwhelming in their support of the hypothesis, a consistent statistical relationship is present in 1970, 1980 and 1990 and the relationship gets stronger with time. It would be interesting to

examine the same framework for the year 2000, to determine if the model continues to strengthen with time. Also, the school quality variables lend interesting results in that the non-traditional measures were the most significant in predicting educational attainment in Virginia. The outcomes and policy implications are relevant and timely as international economic trends increasingly will affect local communities. According to Reich, work and production will continue to become globalized, and, therefore, communities and their leaders must prepare for economic change. The quality of employment opportunities and schooling for future generations is a fundamental consideration in that preparation.

Economic development embraces the creation of empowering possibilities and an overall improvement in a way of life for the residents of all areas. Reich emphasizes the importance of education in the national economy by stating "a nation's real technological assets are the capacities of its citizens to solve the complex problems of the future -- which depend, in turn, on their experience in solving today's and yesterday's problems" (Reich, p.162-163). Education is an essential component of social and economic growth and development, as it contributes to one's full participation in society and offers the possibility of social and economic mobility. Human capital is not only a productive resource but its development is a liberating process of individual meaning and exploration. As the saying goes "once you receive your education, no one can take it away." Perhaps more than physical productive capital, as T.W. Schultz suggests, human capital leads to immeasurable long-term individual and social gains.

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APPENDIX A

Table A.1 Regression Results for Dropout Rate with % African-American Variable (1990,1980,1970)

VARIABLE	COEFFICIENT	STANDARD DEVIATION	T-STATISTIC	PROBABILITY
% Routine Producers, 1990	.0563*	.0213	2.639	.0094
% Routine Producers, 1980	.0281	.0245	1.146	.2541
% Routine Producers, 1970	.0052	.0201	0.257	.7975
% Low-Skill Service, 1990	.1410*	.0330	4.275	.0001
% Low-Skill Service, 1980	.0422	.0380	1.124	.2633
% Low-Skill Service, 1970	.0007	.0321	0.021	.9834
ΔTotal Employment, 1980-1990	2.069*	1.155	1.791	.0758
ΔTotal Employment, 1970-1980	0.900	1.059	0.850	.3969
ΔTotal Employment, 1960-1970	-2.042*	0.856	-2.386	.0186
Unemployment, 1990	.0511	.0898	0.569	.5706
Unemployment, 1980	.0729	.1006	0.850	.3969
Unemployment, 1970	.0098	.0764	0.130	.8972
% of Families in Poverty, 1990	.0324	.0435	0.746	.4572
% of Families in Poverty, 1980	.1959*	.0511	3.831	.0002
% of Families in Poverty, 1970	.0776*	.0270	2.877	.0047
Per Pupil Expenditures, 1990	.0002	.0002	1.285	.2012
Per Pupil Expenditures, 1980	-.0001	.0003	-0.352	.7254
Per Pupil Expenditures, 1970	-.0005	.0005	-0.943	.3478
Student-Teacher Ratio, 1990	-.0306	.0755	-0.406	.6855
Student-Teacher Ratio, 1980	-.4193*	.1022	-4.103	.0001
Student-Teacher Ratio, 1970	.1490*	.0774	1.923	.0565
% in Private High School, 1990	.0547	.0358	1.529	.1288
% in Private High School, 1980	.0876*	.0363	2.414	.0173
% in Private High School, 1970	.0497*	.0209	2.381	.0188
Largest High School, 1990	.0008*	.0003	3.004	.0032
Largest High School, 1980	.0016*	.0003	5.031	.0001
Largest High School, 1970	.0004*	.0003	1.616	.1087
% African-American, 1990	.0047*	.0024	1.962	.0521
% African-American, 1980	.0105	.0088	1.191	.2360
% African-American, 1970	.0165*	.0069	2.378	.0189

Adjusted R^2 for 1990, 1980 and 1970 regressions follow respectively, 27.20, 39.22, and 37.29.

Table A.2 Regression Results for Continuing Education Percentages with % African-American Variable (1990,1980,1970)

VARIABLE	COEFFICIENT	STANDARD DEVIATION	T-STATISTIC	PROBABILITY
% Symbolic Analysts, 1990	.0066*	.0026	2.574	.0113
% Symbolic Analysts, 1980	.0059	.0033	1.789	.0760
% Symbolic Analysts, 1970	.0047	.0030	1.556	.1223
% High-Skill Services, 1990	.0090*	.0030	2.985	.0034
% High-Skill Services, 1980	.0058*	.0019	2.991	.0034
% High-Skill Services, 1970	.0020	.0021	0.937	.3506
ΔTotal Employment, 1980-1990	-.2721*	.0940	-2.895	.0045
ΔTotal Employment, 1970-1980	-.2361*	.0629	-3.753	.0003
ΔTotal Employment, 1960-1970	-.0902	.0655	-1.377	.1711
Unemployment Rate, 1990	-.0081	.0067	-1.209	.2289
Unemployment Rate, 1980	.0020	.0056	0.350	.7266
Unemployment Rate, 1970	.0085	.0057	1.482	.1410
% of Families in Poverty, 1990	.0016	.0036	0.451	.6527
% of Families in Poverty, 1980	-.0008	.0031	-0.243	.8084
% of Families in Poverty, 1970	-.0066	.0021	-3.091	.0025
Per Pupil Expenditures, 1990	$-.13X10^{-5}$	$.16X10^{-4}$	-0.078	.9376
Per Pupil Expenditures, 1980	$-.17X10^{-5}$	$.20X10^{-4}$	-0.083	.9339
Per Pupil Expenditures, 1970	$-.14X10^{-4}$	$.36X10^{-4}$	-0.375	.7085
Student-Teacher Ratio, 1990	-.0010	.0062	-0.161	.8721
Student-Teacher Ratio, 1980	$-.71X10^{-4}$	.0063	-0.011	.9911
Student-Teacher Ratio, 1970	-.0056	.0058	-0.961	.3383
% in Private High School, 1990	-.0051*	.0029	-1.760	.0809
% in Private High School, 1980	-.0017	.0022	-0.797	.4269
% in Private High School, 1970	-.0010	.0016	-0.663	.5084
Largest High School, 1990	$.37X10^{-4}$*	$.21X10^{-4}$	1.727	.0867
Largest High School, 1980	$.62X10^{-4}$*	$.20X10^{-4}$	3.137	.0021
Largest High School, 1970	$.34X10^{-4}$	$.20X10^{-4}$	1.599	.1125
% African-American, 1990	.00014	.00019	0.749	.4555
% African-American, 1980	.00080	.00051	1.579	.1170
% African-American, 1970	.00031	.00048	0.645	.5203

Adjusted R^2 for 1990, 1980 and 1970 regressions are respectively 31.05, 47.46 and 37.60.

Table A.3 Descriptive statistics of % African-American for school districts

Variable Name	N	Mean	Standard Deviation	Minimum Value	Maximum Value
% African-American, 1970	134	25.35	21.25	0.0	79.27
% African-American, 1980	136	24.69	21.13	0.0	78.32
% African-American, 1990	136	22.52	20.15	0.0	82.41

APPENDIX B
VARIANCE INFLATION FACTORS

Dependent Variable: DR90

Variable	Variance Inflation
INTERCEP	0.0000000
R90P	2.2445013
L90S	2.0253705
UE90	3.4214764
T90E	2.3974506
PV90	3.8650417
LG90	1.6439414
ST90	1.5049133
EX90	2.1703873
PRV90	1.5008929

Dependent Variable: CT90

Variable	Variance Inflation
INTERCEP	0.0000000
S90A	4.2327218
H90S	2.0487888
UE90	2.8619077
T90E	2.3368247
PV90	3.8899943
LG90	1.7064090
ST90	1.5226264
EX90	2.5992186
PRV90	1.4061380

Dependent Variable: DR80

Variable	Variance Inflation
INTERCEP	0.0000000
R80P	2.1896653
L80S	2.0300415
UE80	1.8282303
T80E	1.3016572
PV80	1.9566509
LG80	1.5726243
ST80	1.3372078
EX80	2.2120809
PRV80	1.5159661

Dependent Variable: CT80

Variable	Variance Inflation
INTERCEP	0.0000000
S80A	4.8971972
H80S	2.6615820
UE80	1.6291359
T80E	1.2905766
PV80	2.1165311
LG80	1.7373836
ST80	1.4131697
EX80	2.7156264
PRV80	1.4578364

Dependent Variable: DR70

Variable	Variance Inflation
INTERCEP	0.0000000
R70P	3.2561186
L70S	2.3800630
UE70	1.2806593
T70E	1.7504491
PV70	3.0926270
LG70	1.9647282
ST70	1.6513454
EX70	2.8321106
PRV70	1.2910458

Dependent Variable: CT70

Variable	Variance Inflation
INTERCEP	0.0000000
S70A	4.2785507
H70S	3.8610430
UE70	1.2941669
T70E	1.8281108
PV70	3.2681727
LG70	2.0673336
ST70	1.6573996
EX70	2.7835165
PRV70	1.2316876

COLLINEARITY DIAGNOSTICS

DEPENDENT VARIABLE: DR90

Number	Condition Index	INTERCE	R90P	L90S	U90E	T90E	PV90	LG90	ST90	EX90	PRV90
1	1.0000	0.0000	0.0006	0.0001	0.0006	0.0015	0.0006	0.0018	0.0002	0.0002	0.0020
2	3.0876	0.0000	0.0017	0.0001	0.0057	0.1596	0.0098	0.0112	0.0000	0.0000	0.0128
3	5.4660	0.0000	0.0275	0.0001	0.0002	0.1581	0.0002	0.0113	0.0010	0.0011	0.4142
4	6.1948	0.0000	0.0125	0.0002	0.0046	0.0488	0.0022	0.5212	0.0001	0.0000	0.1279
5	9.0985	0.0005	0.1497	0.0000	0.1567	0.3297	0.0739	0.0264	0.0041	0.0039	0.0003
6	11.2540	0.0024	0.1177	0.0105	0.0120	0.0142	0.1470	0.1600	0.0001	0.0832	0.2117
7	17.0319	0.0000	0.0037	0.0137	0.2768	0.0727	0.5408	0.0379	0.0932	0.1523	0.1637
8	18.4361	0.0007	0.3997	0.0240	0.4418	0.0223	0.2231	0.0204	0.2304	0.0259	0.0647
9	27.5039	0.0026	0.0010	0.4340	0.0990	0.0011	0.0012	0.1986	0.4723	0.1109	0.0026
10	65.9915	0.9936	0.2858	0.5173	0.0026	0.1921	0.0012	0.0111	0.1985	0.6225	0.0001

DEPENDENT VARIABLE: DR80

Number	Condition Index	INTERCE	R80P	L80S	U80E	T80E	PV80	LG80	ST80	EX80	PRV80
1	1.0000	0.0000	0.0006	0.0002	0.0006	0.0022	0.0008	0.0015	0.0001	0.0002	0.0023
2	4.1990	0.0000	0.0043	0.0000	0.0011	0.0890	0.0000	0.0000	0.0001	0.0007	0.4246
3	4.8636	0.0000	0.0104	0.0008	0.0165	0.2069	0.0324	0.1023	0.0000	0.0003	0.0189
4	5.9680	0.0000	0.0018	0.0000	0.0031	0.3531	0.0017	0.2983	0.0002	0.0008	0.1137
5	10.7190	0.0001	0.3822	0.0066	0.1633	0.0743	0.0304	0.0091	0.0028	0.0041	0.0260
6	11.5913	0.0024	0.0000	0.0032	0.0105	0.0610	0.4681	0.2922	0.0038	0.0803	0.0613
7	14.5635	0.0007	0.0381	0.0000	0.5151	0.0185	0.3419	0.0333	0.0001	0.1329	0.3462
8	20.0951	0.0027	0.1088	0.2859	0.2555	0.1151	0.0246	0.0108	0.0540	0.1844	0.0057
9	27.7798	0.0012	0.2139	0.3506	0.0329	0.0070	0.0694	0.2448	0.4653	0.0288	0.0004
10	67.1778	0.9928	0.2399	0.3527	0.0013	0.0729	0.0307	0.0077	0.4737	0.5675	0.0009

DEPENDENT VARIABLE: DR70

Number	Condition Index	INTERCE	R70P	L70S	U70E	T70E	PV70	LG70	ST70	EX70	PRV70
1	1.0000	0.0000	0.0004	0.0003	0.0021	0.0021	0.0007	0.0015	0.0001	0.0002	0.0031
2	2.9793	0.0000	0.0010	0.0003	0.0117	0.2629	0.0082	0.0092	0.0000	0.0000	0.0445
3	3.4971	0.0000	0.0007	0.0000	0.0005	0.0507	0.0001	0.0072	0.0001	0.0000	0.6719
4	6.1582	0.0000	0.0061	0.0024	0.0000	0.3895	0.0190	0.3596	0.0000	0.0011	0.0000
5	7.4807	0.0003	0.0120	0.0025	0.9115	0.0627	0.0054	0.0005	0.0017	0.0006	0.0044
6	10.7590	0.0000	0.2056	0.1027	0.0245	0.0114	0.0591	0.0003	0.0010	0.0049	0.1503
7	12.8787	0.0029	0.0011	0.0071	0.0147	0.1180	0.5213	0.3807	0.0038	0.0545	0.0865
8	15.7889	0.0000	0.0098	0.2547	0.0155	0.0640	0.2527	0.0316	0.0088	0.1371	0.0246
9	30.5903	0.0029	0.4746	0.3274	0.0125	0.0032	0.0981	0.2067	0.4574	0.0599	0.0033
10	76.8908	0.9938	0.2888	0.3025	0.0072	0.0356	0.0354	0.0028	0.5273	0.7417	0.0114

DEPENDENT VARIABLE: CT90

Number	Condition Index	INTERCE	S90A	H90S	U90E	T90E	PV90	LG90	ST90	EX90	PRV90
1	1.0000	0.0001	0.0005	0.0002	0.0007	0.0017	0.0006	0.0018	0.0002	0.0002	0.0023
2	3.0959	0.0000	0.0015	0.0000	0.0106	0.1429	0.0137	0.0049	0.0001	0.0001	0.0058
3	5.7209	0.0001	0.0045	0.0001	0.0093	0.1689	0.0030	0.0115	0.0022	0.0006	0.5316
4	6.3750	0.0003	0.0093	0.0000	0.0007	0.2268	0.0180	0.4599	0.0003	0.0000	0.0460
5	8.6278	0.0012	0.0809	0.0116	0.0115	0.0848	0.0418	0.2728	0.0000	0.0158	0.2786
6	12.6061	0.0078	0.1071	0.0065	0.4068	0.1596	0.0002	0.0110	0.0985	0.0001	0.0003
7	16.6165	0.0011	0.0809	0.0213	0.5320	0.0528	0.7937	0.0429	0.0414	0.0128	0.1252
8	21.0821	0.0094	0.2609	0.1711	0.0159	0.0793	0.0985	0.0845	0.0318	0.3736	0.0020
9	21.8606	0.0009	0.3052	0.5287	0.0115	0.0006	0.0082	0.0593	0.2864	0.0040	0.0012
10	51.4107	0.9790	0.1492	0.2606	0.0011	0.0827	0.0222	0.0514	0.5389	0.5929	0.0071

DEPENDENT VARIABLE: CT80

Number	Condition Index	INTERCE	S80A	H80S	U80E	T80E	PV80	LG80	ST80	EX80	PRV80
1	1.0000	0.0000	0.0003	0.0003	0.0007	0.0022	0.0007	0.0015	0.0001	0.0002	0.0025
2	4.2650	0.0000	0.0004	0.0000	0.0016	0.1419	0.0000	0.0030	0.0002	0.0002	0.4129
3	4.7807	0.0001	0.0102	0.0017	0.0344	0.0402	0.0560	0.0620	0.0002	0.0000	0.0067
4	5.7970	0.0000	0.0028	0.0012	0.0059	0.4936	0.0003	0.1200	0.0000	0.0003	0.1890
5	9.3382	0.0005	0.0438	0.0221	0.0019	0.0409	0.0602	0.6199	0.0000	0.0164	0.1489
6	13.9169	0.0002	0.0162	0.0007	0.7290	0.0278	0.4510	0.0090	0.0003	0.0178	0.2236
7	17.5801	0.0161	0.1888	0.1010	0.1747	0.1581	0.0904	0.0151	0.1017	0.0413	0.0123
8	21.1215	0.0070	0.0180	0.6868	0.0005	0.0105	0.2136	0.0007	0.0917	0.0596	0.0002
9	23.1849	0.0036	0.5845	0.0104	0.0117	0.0117	0.1080	0.1410	0.0433	0.4903	0.0039
10	58.7160	0.9725	0.1349	0.1759	0.0396	0.0731	0.0197	0.0278	0.7624	0.3739	0.0000

DEPENDENT VARIABLE: CT70

Number	Condition Index	INTERCE	S70A	H70S	U70E	T70E	PV70	LG70	ST70	EX70	PRV70
1	1.0000	0.0000	0.0006	0.0003	0.0020	0.0024	0.0006	0.0015	0.0001	0.0002	0.0035
2	2.9882	0.0000	0.0015	0.0002	0.0221	0.2253	0.0125	0.0045	0.0001	0.0001	0.0104
3	3.5240	0.0000	0.0000	0.0002	0.0021	0.0213	0.0000	0.0065	0.0001	0.0000	0.7622
4	5.8307	0.0001	0.0173	0.0072	0.0474	0.5586	0.0313	0.1177	0.0001	0.0003	0.0062
5	7.9072	0.0011	0.0001	0.0016	0.8379	0.0024	0.0507	0.0465	0.0029	0.0023	0.0269
6	8.9314	0.0000	0.1132	0.0133	0.0290	0.0053	0.0302	0.5802	0.0009	0.0042	0.1080
7	15.6807	0.0084	0.2549	0.0604	0.0312	0.0578	0.4633	0.1001	0.0505	0.0040	0.0364
8	20.7021	0.0035	0.3934	0.5966	0.0015	0.0737	0.0803	0.0026	0.0778	0.0168	0.0026
9	25.4018	0.0036	0.1929	0.2524	0.0000	0.0089	0.2888	0.0144	0.0120	0.5943	0.0422
10	65.6157	0.9833	0.0262	0.0678	0.0268	0.0443	0.0423	0.1260	0.8556	0.3778	0.0016

CORRELATION ANALYSIS

Pearson Correlation Coefficients
Prob> |R| under Ho: Rho=0
Number of Observations

	DR90	DR80	DR70	CT90	CT80	CT70
DR90	1	0.50633	0.33882	-0.21113	-0.11102	0.03024
	0	0.0001	0.0001	0.0117	0.1884	0.7229
	142	142	140	142	142	140
DR80	0.50633	1	0.46301	-0.08069	-0.09894	-0.18682
	0.0001	0	0.0001	0.3398	0.2414	0.0271
	142	142	140	142	142	140
DR70	0.33882	0.46301	1	-0.171	-0.18697	-0.30389
	0.0001	0.0001	0	0.0434	0.027	0.0003
	140	140	140	140	140	140
CT90	-0.21113	-0.08069	-0.171	1	0.64329	0.40247
	0.0117	0.3398	0.0434	0	0.0001	0.0001
	142	142	140	142	142	140
CT80	-0.11102	-0.09894	-0.18697	0.64329	1	0.59837
	0.1884	0.2414	0.027	0.0001	0	0.0001
	142	142	140	142	142	140
CT70	0.03024	-0.18682	-0.30389	0.40247	0.59837	1
	0.7229	0.0271	0.0003	0.0001	0.0001	0
	140	140	140	140	140	140
S90A	-0.18404	-0.24626	-0.43141	0.48633	0.50188	0.40236
	0.0283	0.0031	0.0001	0.0001	0.0001	0.0001
	142	142	140	142	142	140
S80A	-0.16632	-0.23453	-0.41917	0.54255	0.55617	0.4706
	0.0479	0.005	0.0001	0.0001	0.0001	0.0001
	142	142	140	142	142	140
S70A	-0.15276	-0.25273	-0.46611	0.56171	0.62027	0.53575
	0.0716	0.0026	0.0001	0.0001	0.0001	0.0001
	140	140	140	140	140	140
H90S	-0.23149	-0.11873	-0.35966	0.47273	0.4467	0.31564
	0.0056	0.1593	0.0001	0.0001	0.0001	0.0001
	142	142	140	142	142	140
H80S	-0.09706	-0.09939	-0.41524	0.55558	0.55538	0.40099
	0.2505	0.2393	0.0001	0.0001	0.0001	0.0001
	142	142	140	142	142	140
H70S	-0.03453	-0.04691	-0.37611	0.57238	0.63352	0.54714
	0.6855	0.5821	0.0001	0.0001	0.0001	0.0001
	140	140	140	140	140	140

	DR90	DR80	DR70	CT90	CT80	CT70
R90P	0.06264	0.03522	0.28962	-0.50852	-0.4854	-0.37702
	0.4589	0.6773	0.0005	0.0001	0.0001	0.0001
	142	142	140	142	142	140
R80P	0.07481	0.04417	0.25503	-0.55941	-0.54913	-0.39721
	0.3762	0.6017	0.0024	0.0001	0.0001	0.0001
	142	142	140	142	142	140
R70P	-0.00263	0.00431	0.28455	-0.55148	-0.56982	-0.42289
	0.9754	0.9597	0.0007	0.0001	0.0001	0.0001
	140	140	140	140	140	140
L90S	0.42312	0.40373	0.39402	-0.1861	-0.19295	-0.09548
	0.0001	0.0001	0.0001	0.0266	0.0214	0.2618
	142	142	140	142	142	140
L80S	0.26275	0.3198	0.44623	-0.2651	-0.26208	-0.16296
	0.0016	0.0001	0.0001	0.0014	0.0016	0.0544
	142	142	140	142	142	140
L70S	0.3085	0.2841	0.34751	-0.20782	-0.27094	-0.29792
	0.0002	0.0007	0.0001	0.0137	0.0012	0.0004
	140	140	140	140	140	140
UE90	0.30576	0.35553	0.35619	-0.13479	-0.11786	-0.01689
	0.0002	0.0001	0.0001	0.1097	0.1625	0.843
	142	142	140	142	142	140
UE80	0.24777	0.22026	0.37277	-0.23131	-0.16712	-0.15575
	0.0029	0.0084	0.0001	0.0056	0.0468	0.0661
	142	142	140	142	142	140
UE70	0.069	0.01927	0.22516	-0.10827	-0.11198	-0.10945
	0.4179	0.8213	0.0075	0.2029	0.1877	0.198
	140	140	140	140	140	140
T90E	-0.15061	-0.18649	-0.24368	0.07473	0.04927	-0.0392
	0.0736	0.0263	0.0037	0.3768	0.5604	0.6457
	142	142	140	142	142	140
T80E	-0.21353	-0.12857	-0.07938	-0.11199	-0.22053	-0.28265
	0.0113	0.1301	0.3512	0.1877	0.0088	0.0007
	140	140	140	140	140	140
T70E	-0.11549	-0.21421	-0.43895	0.19383	0.22027	0.28532
	0.1742	0.011	0.0001	0.0218	0.0089	0.0006
	140	140	140	140	140	140

	DR90	DR80	DR70	CT90	CT80	CT70
PV90	0.28008	0.39776	0.49747	-0.24504	-0.20026	-0.14142
	0.0007	0.0001	0.0001	0.0033	0.0169	0.0956
	142	142	140	142	142	140
PV80	0.31097	0.45986	0.60815	-0.35088	-0.31652	-0.31847
	0.0002	0.0001	0.0001	0.0001	0.0001	0.0001
	142	142	140	142	142	140
PV70	0.15359	0.28082	0.5353	-0.4689	-0.56664	-0.54981
	0.07	0.0008	0.0001	0.0001	0.0001	0.0001
	140	140	140	140	140	140
LG90	0.05253	0.01199	-0.18918	0.36419	0.47279	0.31171
	0.5347	0.8874	0.0252	0.0001	0.0001	0.0002
	142	142	140	142	142	140
LG80	0.09709	0.03895	-0.22036	0.40316	0.51498	0.39373
	0.2555	0.6489	0.0091	0.0001	0.0001	0.0001
	139	139	139	139	139	139
LG70	0.1152	0.04494	-0.22971	0.4011	0.5085	0.44141
	0.1769	0.5993	0.0065	0.0001	0.0001	0.0001
	139	139	139	139	139	139
ST90	-0.03598	-0.11193	0.09713	-0.03464	-0.04978	0.06893
	0.6708	0.1848	0.2536	0.6823	0.5564	0.4184
	142	142	140	142	142	140
ST80	-0.02077	-0.25806	-0.0363	-0.04746	0.07489	0.107
	0.8062	0.0019	0.6702	0.5749	0.3757	0.2083
	142	142	140	142	142	140
ST70	0.10111	0.02401	0.17993	-0.14895	-0.01436	-0.02318
	0.2346	0.7782	0.0334	0.079	0.8663	0.7857
	140	140	140	140	140	140
EX90	-0.03756	-0.03113	-0.23341	0.30249	0.33253	0.16466
	0.6572	0.7131	0.0055	0.0003	0.0001	0.0519
	142	142	140	142	142	140
EX80	-0.00835	0.0344	-0.2662	0.35911	0.37664	0.28343
	0.9214	0.6844	0.0015	0.0001	0.0001	0.0007
	142	142	140	142	142	140
EX70	0.01056	0.00682	-0.22295	0.35872	0.35743	0.303
	0.9014	0.9363	0.0081	0.0001	0.0001	0.0003
	140	140	140	140	140	140

	DR90	DR80	DR70	CT90	CT80	CT70
PRV90	0.08031	0.09812	0.07009	0.10728	0.14804	0.0457
	0.3421	0.2454	0.4106	0.2038	0.0787	0.5919
	142	142	140	142	142	140
PRV80	0.13602	0.2147	0.2022	0.09632	0.10877	0.02233
	0.1065	0.0103	0.0166	0.2542	0.1976	0.7934
	142	142	140	142	142	140
PRV70	0.01756	0.11499	0.04832	0.30769	0.08251	0.00896
	0.8368	0.1761	0.5708	0.0002	0.3325	0.9163
	140	140	140	140	140	140
A90A	0.39726	0.42391	0.41301	0.00477	0.08385	-0.08256
	0.0001	0.0001	0.0001	0.955	0.3211	0.3321
	142	142	140	142	142	140
A80A	0.33688	0.3903	0.42815	-0.06284	-0.00278	-0.13818
	0.0001	0.0001	0.0001	0.4575	0.9738	0.1035
	142	142	140	142	142	140
A70A	0.28929	0.36074	0.4389	-0.11	-0.08937	-0.23056
	0.0005	0.0001	0.0001	0.1958	0.2937	0.0061
	140	140	140	140	140	140

	S90A	S80A	S70A	H90S	H80S	H70S
DR90	-0.18404	-0.16632	-0.15276	-0.23149	-0.09706	-0.03453
	0.0283	0.0479	0.0716	0.0056	0.2505	0.6855
	142	142	140	142	142	140
DR80	-0.24626	-0.23453	-0.25273	-0.11873	-0.09939	-0.04691
	0.0031	0.005	0.0026	0.1593	0.2393	0.5821
	142	142	140	142	142	140
DR70	-0.43141	-0.41917	-0.46611	-0.35966	-0.41524	-0.37611
	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
	140	140	140	140	140	140
CT90	0.48633	0.54255	0.56171	0.47273	0.55558	0.57238
	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
	142	142	140	142	142	140
CT80	0.50188	0.55617	0.62027	0.4467	0.55538	0.63352
	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
	142	142	140	142	142	140
CT70	0.40236	0.4706	0.53575	0.31564	0.40099	0.54714
	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
	140	140	140	140	140	140
S90A	1	0.95345	0.85868	0.68586	0.76037	0.7504
	0	0.0001	0.0001	0.0001	0.0001	0.0001
	142	142	140	142	142	140
S80A	0.95345	1	0.8888	0.67353	0.76725	0.80284
	0.0001	0	0.0001	0.0001	0.0001	0.0001
	142	142	140	142	142	140
S70A	0.85868	0.8888	1	0.65369	0.80681	0.80052
	0.0001	0.0001	0	0.0001	0.0001	0.0001
	140	140	140	140	140	140
H90S	0.68586	0.67353	0.65369	1	0.82995	0.74688
	0.0001	0.0001	0.0001	0	0.0001	0.0001
	142	142	140	142	142	140
H80S	0.76037	0.76725	0.80681	0.82995	1	0.82501
	0.0001	0.0001	0.0001	0.0001	0	0.0001
	142	142	140	142	142	140
H70S	0.7504	0.80284	0.80052	0.74688	0.82501	1
	0.0001	0.0001	0.0001	0.0001	0.0001	0
	140	140	140	140	140	140

	S90A	S80A	S70A	H90S	H80S	H70S
R90P	-0.79543	-0.7812	-0.76575	-0.81625	-0.81163	-0.78823
	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
	142	142	140	142	142	140
R80P	-0.7676	-0.7828	-0.78285	-0.76688	-0.82185	-0.76803
	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
	142	142	140	142	142	140
R70P	-0.72214	-0.76477	-0.79578	-0.68699	-0.76724	-0.81781
	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
	140	140	140	140	140	140
L90S	-0.61007	-0.55427	-0.41895	-0.37698	-0.32469	-0.26071
	0.0001	0.0001	0.0001	0.0001	0.0001	0.0019
	142	142	140	142	142	140
L80S	-0.56182	-0.58021	-0.50403	-0.33279	-0.52354	-0.37491
	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
	142	142	140	142	142	140
L70S	-0.35286	-0.3833	-0.40522	-0.18497	-0.26062	-0.39026
	0.0001	0.0001	0.0001	0.0287	0.0019	0.0001
	140	140	140	140	140	140
UE90	-0.41346	-0.34674	-0.26892	-0.33337	-0.29637	-0.13006
	0.0001	0.0001	0.0013	0.0001	0.0003	0.1256
	142	142	140	142	142	140
UE80	-0.49119	-0.46769	-0.35413	-0.43724	-0.40876	-0.32592
	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
	142	142	140	142	142	140
UE70	-0.35288	-0.32207	-0.25259	-0.33217	-0.33496	-0.30613
	0.0001	0.0001	0.0026	0.0001	0.0001	0.0002
	140	140	140	140	140	140
T90E	0.4821	0.39642	0.25668	0.45969	0.34743	0.17485
	0.0001	0.0001	0.0022	0.0001	0.0001	0.0388
	142	142	140	142	142	140
T80E	0.15867	0.06786	-0.07558	0.19382	0.07415	-0.13889
	0.0611	0.4257	0.3748	0.0218	0.384	0.1017
	140	140	140	140	140	140
T70E	0.52358	0.47599	0.49563	0.50185	0.53456	0.47062
	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
	140	140	140	140	140	140

	S90A	S80A	S70A	H90S	H80S	H70S
PV90	-0.6134	-0.51648	-0.46022	-0.51534	-0.51319	-0.37563
	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
	142	142	140	142	142	140
PV80	-0.6373	-0.58982	-0.60507	-0.50861	-0.60244	-0.5046
	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
	142	142	140	142	142	140
PV70	-0.62977	-0.65571	-0.6883	-0.58595	-0.66909	-0.73219
	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
	140	140	140	140	140	140
LG90	0.51973	0.53834	0.49455	0.46159	0.48726	0.58273
	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
	142	142	140	142	142	140
LG80	0.54547	0.57593	0.54295	0.48258	0.53299	0.64286
	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
	139	139	139	139	139	139
LG70	0.51092	0.54619	0.54217	0.45566	0.52042	0.64488
	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
	139	139	139	139	139	139
ST90	-0.08614	-0.03118	-0.06781	0.00362	-0.05691	-0.08567
	0.3081	0.7126	0.426	0.9659	0.5011	0.3142
	142	142	140	142	142	140
ST80	0.07158	0.05588	0.06996	0.01383	-0.02983	-0.01083
	0.3973	0.5089	0.4114	0.8703	0.7245	0.899
	142	142	140	142	142	140
ST70	-0.15664	-0.19038	-0.17723	-0.0688	-0.1094	-0.11317
	0.0646	0.0243	0.0362	0.4192	0.1982	0.1831
	140	140	140	140	140	140
EX90	0.58794	0.59989	0.54625	0.25335	0.42879	0.47572
	0.0001	0.0001	0.0001	0.0023	0.0001	0.0001
	142	142	140	142	142	140
EX80	0.6176	0.64274	0.60815	0.2901	0.45209	0.52781
	0.0001	0.0001	0.0001	0.0005	0.0001	0.0001
	142	142	140	142	142	140
EX70	0.63803	0.69883	0.64402	0.31804	0.46589	0.52441
	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
	140	140	140	140	140	140

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	S90A	S80A	S70A	H90S	H80S	H70S
PRV90	0.43764	0.42843	0.33027	0.31822	0.25732	0.26627
	0.0001	0.0001	0.0001	0.0001	0.002	0.0015
	142	142	140	142	142	140
PRV80	0.22486	0.2462	0.24992	0.071	0.12882	0.13691
	0.0071	0.0031	0.0029	0.4011	0.1265	0.1067
	142	142	140	142	142	140
PRV70	0.17459	0.21932	0.25924	0.15737	0.16761	0.11897
	0.0391	0.0092	0.002	0.0633	0.0478	0.1615
	140	140	140	140	140	140
A90A	-0.18059	-0.1752	-0.16977	-0.12688	-0.12704	-0.07096
	0.0315	0.037	0.0449	0.1324	0.1319	0.4048
	142	142	140	142	142	140
A80A	-0.21228	-0.2291	-0.24937	-0.17562	-0.21023	-0.18297
	0.0112	0.0061	0.003	0.0366	0.012	0.0305
	142	142	140	142	142	140
A70A	-0.24006	-0.28365	-0.32469	-0.20854	-0.26662	-0.29807
	0.0043	0.0007	0.0001	0.0134	0.0015	0.0003
	140	140	140	140	140	140

	R90P	R80P	R70P	L90S	L80S	L70S
DR90	0.06264	0.07481	-0.00263	0.42312	0.26275	0.3085
	0.4589	0.3762	0.9754	0.0001	0.0016	0.0002
	142	142	140	142	142	140
DR80	0.03522	0.04417	0.00431	0.40373	0.3198	0.2841
	0.6773	0.6017	0.9597	0.0001	0.0001	0.0007
	142	142	140	142	142	140
DR70	0.28962	0.25503	0.28455	0.39402	0.44623	0.34751
	0.0005	0.0024	0.0007	0.0001	0.0001	0.0001
	140	140	140	140	140	140
CT90	-0.50852	-0.55941	-0.55148	-0.1861	-0.2651	-0.20782
	0.0001	0.0001	0.0001	0.0266	0.0014	0.0137
	142	142	140	142	142	140
CT80	-0.4854	-0.54913	-0.56982	-0.19295	-0.26208	-0.27094
	0.0001	0.0001	0.0001	0.0214	0.0016	0.0012
	142	142	140	142	142	140
CT70	-0.37702	-0.39721	-0.42289	-0.09548	-0.16296	-0.29792
	0.0001	0.0001	0.0001	0.2618	0.0544	0.0004
	140	140	140	140	140	140
S90A	-0.79543	-0.7676	-0.72214	-0.61007	-0.56182	-0.35286
	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
	142	142	140	142	142	140
S80A	-0.7812	-0.7828	-0.76477	-0.55427	-0.58021	-0.3833
	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
	142	142	140	142	142	140
S70A	-0.76575	-0.78285	-0.79578	-0.41895	-0.50403	-0.40522
	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
	140	140	140	140	140	140
H90S	-0.81625	-0.76688	-0.68699	-0.37698	-0.33279	-0.18497
	0.0001	0.0001	0.0001	0.0001	0.0001	0.0287
	142	142	140	142	142	140
H80S	-0.81163	-0.82185	-0.76724	-0.32469	-0.52354	-0.26062
	0.0001	0.0001	0.0001	0.0001	0.0001	0.0019
	142	142	140	142	142	140
H70S	-0.78823	-0.76803	-0.81781	-0.26071	-0.37491	-0.39026
	0.0001	0.0001	0.0001	0.0019	0.0001	0.0001
	140	140	140	140	140	140

	R90P	R80P	R70P	L90S	L80S	L70S
R90P	1	0.95803	0.89131	0.11296	0.14128	-0.00864
	0	0.0001	0.0001	0.1808	0.0935	0.9193
	142	142	140	142	142	140
R80P	0.95803	1	0.91196	0.1205	0.13243	-0.0153
	0.0001	0	0.0001	0.1532	0.1162	0.8576
	142	142	140	142	142	140
R70P	0.89131	0.91196	1	0.08672	0.15929	-0.06067
	0.0001	0.0001	0	0.3083	0.0601	0.4765
	140	140	140	140	140	140
L90S	0.11296	0.1205	0.08672	1	0.79625	0.61954
	0.1808	0.1532	0.3083	0	0.0001	0.0001
	142	142	140	142	142	140
L80S	0.14128	0.13243	0.15929	0.79625	1	0.68121
	0.0935	0.1162	0.0601	0.0001	0	0.0001
	142	142	140	142	142	140
L70S	-0.00864	-0.0153	-0.06067	0.61954	0.68121	1
	0.9193	0.8576	0.4765	0.0001	0.0001	0
	140	140	140	140	140	140
UE90	0.16249	0.18278	0.12621	0.58752	0.50366	0.24635
	0.0533	0.0295	0.1373	0.0001	0.0001	0.0033
	142	142	140	142	142	140
UE80	0.2775	0.27746	0.26074	0.55748	0.54033	0.30878
	0.0008	0.0008	0.0019	0.0001	0.0001	0.0002
	142	142	140	142	142	140
UE70	0.2022	0.17132	0.21637	0.33944	0.3706	0.21797
	0.0166	0.043	0.0102	0.0001	0.0001	0.0097
	140	140	140	140	140	140
T90E	-0.31969	-0.30235	-0.18973	-0.512	-0.36242	-0.10357
	0.0001	0.0003	0.0248	0.0001	0.0001	0.2233
	142	142	140	142	142	140
T80E	-0.08342	-0.03295	0.06197	-0.2879	-0.15811	0.08811
	0.3271	0.6992	0.467	0.0006	0.0621	0.3006
	140	140	140	140	140	140
T70E	-0.39682	-0.35996	-0.35771	-0.39147	-0.43141	-0.28994
	0.0001	0.0001	0.0001	0.0001	0.0001	0.0005
	140	140	140	140	140	140

	R90P	R80P	R70P	L90S	L80S	L70S
PV90	0.42515	0.39818	0.3311	0.5307	0.47357	0.25972
	0.0001	0.0001	0.0001	0.0001	0.0001	0.0019
	142	142	140	142	142	140
PV80	0.44498	0.40648	0.37255	0.49123	0.5421	0.39965
	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
	142	142	140	142	142	140
PV70	0.48852	0.4712	0.48765	0.40219	0.50518	0.51424
	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
	140	140	140	140	140	140
LG90	-0.40779	-0.39842	-0.43423	-0.34534	-0.3592	-0.32257
	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
	142	142	140	142	142	140
LG80	-0.42919	-0.41679	-0.45664	-0.33995	-0.39094	-0.38593
	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
	139	139	139	139	139	139
LG70	-0.40488	-0.38895	-0.43727	-0.30607	-0.38442	-0.41466
	0.0001	0.0001	0.0001	0.0002	0.0001	0.0001
	139	139	139	139	139	139
ST90	0.11219	0.11043	0.12141	-0.03497	-0.03154	-0.01683
	0.1838	0.1908	0.153	0.6795	0.7095	0.8435
	142	142	140	142	142	140
ST80	0.08954	0.12167	0.11124	-0.20596	-0.16265	-0.16875
	0.2893	0.1492	0.1907	0.0139	0.0531	0.0463
	142	142	140	142	142	140
ST70	0.1908	0.22404	0.23791	0.00973	-0.00438	-0.08273
	0.0239	0.0078	0.0046	0.9092	0.9591	0.3312
	140	140	140	140	140	140
EX90	-0.50602	-0.51902	-0.55575	-0.20701	-0.27905	-0.13692
	0.0001	0.0001	0.0001	0.0134	0.0008	0.1067
	142	142	140	142	142	140
EX80	-0.55516	-0.57341	-0.61321	-0.20611	-0.27906	-0.17116
	0.0001	0.0001	0.0001	0.0139	0.0008	0.0432
	142	142	140	142	142	140
EX70	-0.52359	-0.56409	-0.60476	-0.30082	-0.3503	-0.21874
	0.0001	0.0001	0.0001	0.0003	0.0001	0.0094
	140	140	140	140	140	140

	R90P	R80P	R70P	L90S	L80S	L70S
PRV90	-0.43849	-0.40965	-0.38278	-0.16823	-0.10843	0.06269
	0.0001	0.0001	0.0001	0.0454	0.199	0.4618
	142	142	140	142	142	140
PRV80	-0.23779	-0.27052	-0.28877	-0.0242	-0.04436	0.06911
	0.0044	0.0011	0.0005	0.775	0.6002	0.4172
	142	142	140	142	142	140
PRV70	-0.22245	-0.27532	-0.32239	-0.02681	-0.05377	0.11695
	0.0083	0.001	0.0001	0.7532	0.5281	0.1688
	140	140	140	140	140	140
A90A	-0.02528	-0.06999	-0.102	0.3909	0.36068	0.39254
	0.7652	0.4078	0.2304	0.0001	0.0001	0.0001
	142	142	140	142	142	140
A80A	0.01299	-0.03059	-0.05193	0.38487	0.41182	0.49391
	0.8781	0.7178	0.5423	0.0001	0.0001	0.0001
	142	142	140	142	142	140
A70A	0.05223	0.01419	0.02121	0.36831	0.43123	0.55897
	0.54	0.8678	0.8035	0.0001	0.0001	0.0001
	140	140	140	140	140	140

	UE90	UE80	UE70	T90E	T80E	T70E
DR90	0.30576	0.24777	0.069	-0.15061	-0.21353	-0.11549
	0.0002	0.0029	0.4179	0.0736	0.0113	0.1742
	142	142	140	142	140	140
DR80	0.35553	0.22026	0.01927	-0.18649	-0.12857	-0.21421
	0.0001	0.0084	0.8213	0.0263	0.1301	0.011
	142	142	140	142	140	140
DR70	0.35619	0.37277	0.22516	-0.24368	-0.07938	-0.43895
	0.0001	0.0001	0.0075	0.0037	0.3512	0.0001
	140	140	140	140	140	140
CT90	-0.13479	-0.23131	-0.10827	0.07473	-0.11199	0.19383
	0.1097	0.0056	0.2029	0.3768	0.1877	0.0218
	142	142	140	142	140	140
CT80	-0.11786	-0.16712	-0.11198	0.04927	-0.22053	0.22027
	0.1625	0.0468	0.1877	0.5604	0.0088	0.0089
	142	142	140	142	140	140
CT70	-0.01689	-0.15575	-0.10945	-0.0392	-0.28265	0.28532
	0.843	0.0661	0.198	0.6457	0.0007	0.0006
	140	140	140	140	140	140
S90A	-0.41346	-0.49119	-0.35288	0.4821	0.15867	0.52358
	0.0001	0.0001	0.0001	0.0001	0.0611	0.0001
	142	142	140	142	140	140
S80A	-0.34674	-0.46769	-0.32207	0.39642	0.06786	0.47599
	0.0001	0.0001	0.0001	0.0001	0.4257	0.0001
	142	142	140	142	140	140
S70A	-0.26892	-0.35413	-0.25259	0.25668	-0.07558	0.49563
	0.0013	0.0001	0.0026	0.0022	0.3748	0.0001
	140	140	140	140	140	140
H90S	-0.33337	-0.43724	-0.33217	0.45969	0.19382	0.50185
	0.0001	0.0001	0.0001	0.0001	0.0218	0.0001
	142	142	140	142	140	140
H80S	-0.29637	-0.40876	-0.33496	0.34743	0.07415	0.53456
	0.0003	0.0001	0.0001	0.0001	0.384	0.0001
	142	142	140	142	140	140
H70S	-0.13006	-0.32592	-0.30613	0.17485	-0.13889	0.47062
	0.1256	0.0001	0.0002	0.0388	0.1017	0.0001
	140	140	140	140	140	140

	UE90	UE80	UE70	T90E	T80E	T70E
R90P	0.16249	0.2775	0.2022	-0.31969	-0.08342	-0.39682
	0.0533	0.0008	0.0166	0.0001	0.3271	0.0001
	142	142	140	142	140	140
R80P	0.18278	0.27746	0.17132	-0.30235	-0.03295	-0.35996
	0.0295	0.0008	0.043	0.0003	0.6992	0.0001
	142	142	140	142	140	140
R70P	0.12621	0.26074	0.21637	-0.18973	0.06197	-0.35771
	0.1373	0.0019	0.0102	0.0248	0.467	0.0001
	140	140	140	140	140	140
L90S	0.58752	0.55748	0.33944	-0.512	-0.2879	-0.39147
	0.0001	0.0001	0.0001	0.0001	0.0006	0.0001
	142	142	140	142	140	140
L80S	0.50366	0.54033	0.3706	-0.36242	-0.15811	-0.43141
	0.0001	0.0001	0.0001	0.0001	0.0621	0.0001
	142	142	140	142	140	140
L70S	0.24635	0.30878	0.21797	-0.10357	0.08811	-0.28994
	0.0033	0.0002	0.0097	0.2233	0.3006	0.0005
	140	140	140	140	140	140
UE90	1	0.67645	0.41913	-0.5914	-0.26536	-0.42859
	0	0.0001	0.0001	0.0001	0.0015	0.0001
	142	142	140	142	140	140
UE80	0.67645	1	0.59484	-0.40712	-0.29264	-0.43853
	0.0001	0	0.0001	0.0001	0.0005	0.0001
	142	142	140	142	140	140
UE70	0.41913	0.59484	1	-0.39629	-0.15019	-0.35525
	0.0001	0.0001	0	0.0001	0.0765	0.0001
	140	140	140	140	140	140
T90E	-0.5914	-0.40712	-0.39629	1	0.541	0.51716
	0.0001	0.0001	0.0001	0	0.0001	0.0001
	142	142	140	142	140	140
T80E	-0.26536	-0.29264	-0.15019	0.541	1	0.15269
	0.0015	0.0005	0.0765	0.0001	0	0.0717
	140	140	140	140	140	140
T70E	-0.42859	-0.43853	-0.35525	0.51716	0.15269	1
	0.0001	0.0001	0.0001	0.0001	0.0717	0
	140	140	140	140	140	140

	UE90	UE80	UE70	T90E	T80E	T70E
PV90	0.76885	0.6183	0.48008	-0.67069	-0.32209	-0.65731
	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
	142	142	140	142	140	140
PV80	0.53647	0.53226	0.41947	-0.44203	-0.24859	-0.64793
	0.0001	0.0001	0.0001	0.0001	0.0031	0.0001
	142	142	140	142	140	140
PV70	0.40455	0.45372	0.44368	-0.30496	0.0932	-0.64403
	0.0001	0.0001	0.0001	0.0002	0.2734	0.0001
	140	140	140	140	140	140
LG90	-0.14989	-0.26616	-0.23335	0.34344	0.19165	0.52877
	0.075	0.0014	0.0055	0.0001	0.0233	0.0001
	142	142	140	142	140	140
LG80	-0.1242	-0.26795	-0.22097	0.27244	0.08946	0.51009
	0.1452	0.0014	0.0089	0.0012	0.295	0.0001
	139	139	139	139	139	139
LG70	-0.08461	-0.23313	-0.18922	0.15899	-0.0201	0.4447
	0.322	0.0057	0.0257	0.0616	0.8144	0.0001
	139	139	139	139	139	139
ST90	0.02525	0.02216	0.01966	0.15941	0.11293	0.08992
	0.7655	0.7935	0.8177	0.0581	0.184	0.2907
	142	142	140	142	140	140
ST80	-0.09467	-0.06331	-0.07478	0.11908	0.11789	0.1121
	0.2624	0.4542	0.3799	0.1581	0.1654	0.1873
	142	142	140	142	140	140
ST70	-0.03795	0.02365	-0.11667	0.02121	-0.0509	0.09399
	0.6562	0.7815	0.1698	0.8036	0.5504	0.2693
	140	140	140	140	140	140
EX90	-0.09806	-0.23447	-0.08088	-0.05345	-0.12543	0.13068
	0.2456	0.005	0.3421	0.5276	0.1398	0.1238
	142	142	140	142	140	140
EX80	-0.08733	-0.2403	-0.06012	-0.04963	-0.19897	0.14402
	0.3014	0.004	0.4804	0.5575	0.0184	0.0896
	142	142	140	142	140	140
EX70	-0.10712	-0.22096	-0.06589	0.02111	-0.20085	0.08738
	0.2078	0.0087	0.4392	0.8045	0.0173	0.3046
	140	140	140	140	140	140

	UE90	UE80	UE70	T90E	T80E	T70E
PRV90	-0.26881	-0.33175	-0.17738	0.25773	0.01298	0.20126
	0.0012	0.0001	0.036	0.002	0.879	0.0171
	142	142	140	142	140	140
PRV80	-0.13279	-0.20626	-0.07421	-0.00751	-0.21493	-0.0572
	0.1152	0.0138	0.3835	0.9293	0.0108	0.5021
	142	142	140	142	140	140
PRV70	-0.14945	-0.25002	-0.08642	0.02884	-0.14692	0.07094
	0.078	0.0029	0.31	0.7352	0.0832	0.4049
	140	140	140	140	140	140
A90A	0.11591	0.15146	0.11734	-0.17887	-0.31303	-0.21277
	0.1695	0.072	0.1674	0.0332	0.0002	0.0116
	142	142	140	142	140	140
A80A	0.08798	0.14185	0.12959	-0.15116	-0.25083	-0.2524
	0.2978	0.0922	0.127	0.0725	0.0028	0.0026
	142	142	140	142	140	140
A70A	0.02518	0.10211	0.12495	-0.06467	-0.09675	-0.27949
	0.7678	0.23	0.1413	0.4478	0.2555	0.0008
	140	140	140	140	140	140

	PV90	PV80	PV70	LG90	LG80	LG70
DR90	0.28008	0.31097	0.15359	0.05253	0.09709	0.1152
	0.0007	0.0002	0.07	0.5347	0.2555	0.1769
	142	142	140	142	139	139
DR80	0.39776	0.45986	0.28082	0.01199	0.03895	0.04494
	0.0001	0.0001	0.0008	0.8874	0.6489	0.5993
	142	142	140	142	139	139
DR70	0.49747	0.60815	0.5353	-0.18918	-0.22036	-0.22971
	0.0001	0.0001	0.0001	0.0252	0.0091	0.0065
	140	140	140	140	139	139
CT90	-0.24504	-0.35088	-0.4689	0.36419	0.40316	0.4011
	0.0033	0.0001	0.0001	0.0001	0.0001	0.0001
	142	142	140	142	139	139
CT80	-0.20026	-0.31652	-0.56664	0.47279	0.51498	0.5085
	0.0169	0.0001	0.0001	0.0001	0.0001	0.0001
	142	142	140	142	139	139
CT70	-0.14142	-0.31847	-0.54981	0.31171	0.39373	0.44141
	0.0956	0.0001	0.0001	0.0002	0.0001	0.0001
	140	140	140	140	139	139
S90A	-0.6134	-0.6373	-0.62977	0.51973	0.54547	0.51092
	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
	142	142	140	142	139	139
S80A	-0.51648	-0.58982	-0.65571	0.53834	0.57593	0.54619
	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
	142	142	140	142	139	139
S70A	-0.46022	-0.60507	-0.6883	0.49455	0.54295	0.54217
	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
	140	140	140	140	139	139
H90S	-0.51534	-0.50861	-0.58595	0.46159	0.48258	0.45566
	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
	142	142	140	142	139	139
H80S	-0.51319	-0.60244	-0.66909	0.48726	0.53299	0.52042
	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
	142	142	140	142	139	139
H70S	-0.37563	-0.5046	-0.73219	0.58273	0.64286	0.64488
	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
	140	140	140	140	139	139

	PV90	PV80	PV70	LG90	LG80	LG70
R90P	0.42515	0.44498	0.48852	-0.40779	-0.42919	-0.40488
	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
	142	142	140	142	139	139
R80P	0.39818	0.40648	0.4712	-0.39842	-0.41679	-0.38895
	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
	142	142	140	142	139	139
R70P	0.3311	0.37255	0.48765	-0.43423	-0.45664	-0.43727
	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
	140	140	140	140	139	139
L90S	0.5307	0.49123	0.40219	-0.34534	-0.33995	-0.30607
	0.0001	0.0001	0.0001	0.0001	0.0001	0.0002
	142	142	140	142	139	139
L80S	0.47357	0.5421	0.50518	-0.3592	-0.39094	-0.38442
	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
	142	142	140	142	139	139
L70S	0.25972	0.39965	0.51424	-0.32257	-0.38593	-0.41466
	0.0019	0.0001	0.0001	0.0001	0.0001	0.0001
	140	140	140	140	139	139
UE90	0.76885	0.53647	0.40455	-0.14989	-0.1242	-0.08461
	0.0001	0.0001	0.0001	0.075	0.1452	0.322
	142	142	140	142	139	139
UE80	0.6183	0.53226	0.45372	-0.26616	-0.26795	-0.23313
	0.0001	0.0001	0.0001	0.0014	0.0014	0.0057
	142	142	140	142	139	139
UE70	0.48008	0.41947	0.44368	-0.23335	-0.22097	-0.18922
	0.0001	0.0001	0.0001	0.0055	0.0089	0.0257
	140	140	140	140	139	139
T90E	-0.67069	-0.44203	-0.30496	0.34344	0.27244	0.15899
	0.0001	0.0001	0.0002	0.0001	0.0012	0.0616
	142	142	140	142	139	139
T80E	-0.32209	-0.24859	0.0932	0.19165	0.08946	-0.0201
	0.0001	0.0031	0.2734	0.0233	0.295	0.8144
	140	140	140	140	139	139
T70E	-0.65731	-0.64793	-0.64403	0.52877	0.51009	0.4447
	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
	140	140	140	140	139	139

	PV90	PV80	PV70	LG90	LG80	LG70
PV90	1	0.80945	0.65826	-0.34014	-0.33011	-0.27164
	0	0.0001	0.0001	0.0001	0.0001	0.0012
	142	142	140	142	139	139
PV80	0.80945	1	0.79194	-0.38903	-0.39617	-0.35511
	0.0001	0	0.0001	0.0001	0.0001	0.0001
	142	142	140	142	139	139
PV70	0.65826	0.79194	1	-0.52546	-0.57301	-0.56917
	0.0001	0.0001	0	0.0001	0.0001	0.0001
	140	140	140	140	139	139
LG90	-0.34014	-0.38903	-0.52546	1	0.95488	0.82276
	0.0001	0.0001	0.0001	0	0.0001	0.0001
	142	142	140	142	139	139
LG80	-0.33011	-0.39617	-0.57301	0.95488	1	0.95444
	0.0001	0.0001	0.0001	0.0001	0	0.0001
	139	139	139	139	139	139
LG70	-0.27164	-0.35511	-0.56917	0.82276	0.95444	1
	0.0012	0.0001	0.0001	0.0001	0.0001	0
	139	139	139	139	139	139
ST90	0.02306	-0.01282	0.03482	0.27056	0.2292	0.16123
	0.7853	0.8796	0.6829	0.0011	0.0066	0.0579
	142	142	140	142	139	139
ST80	-0.08688	-0.0859	-0.11217	0.3086	0.28056	0.23182
	0.3039	0.3094	0.187	0.0002	0.0008	0.006
	142	142	140	142	139	139
ST70	-0.06844	-0.02816	-0.07839	0.15104	0.18192	0.19863
	0.4217	0.7412	0.3572	0.0749	0.0321	0.0191
	140	140	140	140	139	139
EX90	-0.18989	-0.24652	-0.28458	0.16246	0.203	0.22403
	0.0236	0.0031	0.0007	0.0534	0.0165	0.008
	142	142	140	142	139	139
EX80	-0.16292	-0.21711	-0.29237	0.168	0.20972	0.23188
	0.0527	0.0094	0.0005	0.0457	0.0132	0.006
	142	142	140	142	139	139
EX70	-0.12268	-0.16777	-0.25188	0.2535	0.27955	0.28019
	0.1487	0.0476	0.0027	0.0025	0.0009	0.0008
	140	140	140	140	139	139

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	PV90	PV80	PV70	LG90	LG80	LG70
PRV90	-0.20868	-0.10328	-0.10013	0.18366	0.16681	0.12936
	0.0127	0.2213	0.2391	0.0287	0.0497	0.1291
	142	142	140	142	139	139
PRV80	0.01323	0.07488	0.03211	-0.03113	-0.03848	-0.04371
	0.8758	0.3758	0.7064	0.7131	0.6529	0.6094
	142	142	140	142	139	139
PRV70	-0.09452	-0.04808	-0.06835	-0.01018	-0.01118	-0.02202
	0.2666	0.5727	0.4223	0.905	0.8961	0.7969
	140	140	140	140	139	139
A90A	0.283	0.49208	0.27879	-0.04868	-0.03398	-0.01062
	0.0006	0.0001	0.0009	0.5651	0.6913	0.9013
	142	142	140	142	139	139
A80A	0.27574	0.52127	0.3786	-0.15039	-0.16339	-0.15142
	0.0009	0.0001	0.0001	0.074	0.0546	0.0752
	142	142	140	142	139	139
A70A	0.21652	0.51132	0.46392	-0.22515	-0.24955	-0.25149
	0.0102	0.0001	0.0001	0.0075	0.0031	0.0028
	140	140	140	140	139	139

	ST90	ST80	ST70	EX90	EX80	EX70
DR90	-0.03598	-0.02077	0.10111	-0.03756	-0.00835	0.01056
	0.6708	0.8062	0.2346	0.6572	0.9214	0.9014
	142	142	140	142	142	140
DR80	-0.11193	-0.25806	0.02401	-0.03113	0.0344	0.00682
	0.1848	0.0019	0.7782	0.7131	0.6844	0.9363
	142	142	140	142	142	140
DR70	0.09713	-0.0363	0.17993	-0.23341	-0.2662	-0.22295
	0.2536	0.6702	0.0334	0.0055	0.0015	0.0081
	140	140	140	140	140	140
CT90	-0.03464	-0.04746	-0.14895	0.30249	0.35911	0.35872
	0.6823	0.5749	0.079	0.0003	0.0001	0.0001
	142	142	140	142	142	140
CT80	-0.04978	0.07489	-0.01436	0.33253	0.37664	0.35743
	0.5564	0.3757	0.8663	0.0001	0.0001	0.0001
	142	142	140	142	142	140
CT70	0.06893	0.107	-0.02318	0.16466	0.28343	0.303
	0.4184	0.2083	0.7857	0.0519	0.0007	0.0003
	140	140	140	140	140	140
S90A	-0.08614	0.07158	-0.15664	0.58794	0.6176	0.63803
	0.3081	0.3973	0.0646	0.0001	0.0001	0.0001
	142	142	140	142	142	140
S80A	-0.03118	0.05588	-0.19038	0.59989	0.64274	0.69883
	0.7126	0.5089	0.0243	0.0001	0.0001	0.0001
	142	142	140	142	142	140
S70A	-0.06781	0.06996	-0.17723	0.54625	0.60815	0.64402
	0.426	0.4114	0.0362	0.0001	0.0001	0.0001
	140	140	140	140	140	140
H90S	0.00362	0.01383	-0.0688	0.25335	0.2901	0.31804
	0.9659	0.8703	0.4192	0.0023	0.0005	0.0001
	142	142	140	142	142	140
H80S	-0.05691	-0.02983	-0.1094	0.42879	0.45209	0.46589
	0.5011	0.7245	0.1982	0.0001	0.0001	0.0001
	142	142	140	142	142	140
H70S	-0.08567	-0.01083	-0.11317	0.47572	0.52781	0.52441
	0.3142	0.899	0.1831	0.0001	0.0001	0.0001
	140	140	140	140	140	140

	ST90	ST80	ST70	EX90	EX80	EX70
R90P	0.11219	0.08954	0.1908	-0.50602	-0.55516	-0.52359
	0.1838	0.2893	0.0239	0.0001	0.0001	0.0001
	142	142	140	142	142	140
R80P	0.11043	0.12167	0.22404	-0.51902	-0.57341	-0.56409
	0.1908	0.1492	0.0078	0.0001	0.0001	0.0001
	142	142	140	142	142	140
R70P	0.12141	0.11124	0.23791	-0.55575	-0.61321	-0.60476
	0.153	0.1907	0.0046	0.0001	0.0001	0.0001
	140	140	140	140	140	140
L90S	-0.03497	-0.20596	0.00973	-0.20701	-0.20611	-0.30082
	0.6795	0.0139	0.9092	0.0134	0.0139	0.0003
	142	142	140	142	142	140
L80S	-0.03154	-0.16265	-0.00438	-0.27905	-0.27906	-0.3503
	0.7095	0.0531	0.9591	0.0008	0.0008	0.0001
	142	142	140	142	142	140
L70S	-0.01683	-0.16875	-0.08273	-0.13692	-0.17116	-0.21874
	0.8435	0.0463	0.3312	0.1067	0.0432	0.0094
	140	140	140	140	140	140
UE90	0.02525	-0.09467	-0.03795	-0.09806	-0.08733	-0.10712
	0.7655	0.2624	0.6562	0.2456	0.3014	0.2078
	142	142	140	142	142	140
UE80	0.02216	-0.06331	0.02365	-0.23447	-0.2403	-0.22096
	0.7935	0.4542	0.7815	0.005	0.004	0.0087
	142	142	140	142	142	140
UE70	0.01966	-0.07478	-0.11667	-0.08088	-0.06012	-0.06589
	0.8177	0.3799	0.1698	0.3421	0.4804	0.4392
	140	140	140	140	140	140
T90E	0.15941	0.11908	0.02121	-0.05345	-0.04963	0.02111
	0.0581	0.1581	0.8036	0.5276	0.5575	0.8045
	142	142	140	142	142	140
T80E	0.11293	0.11789	-0.0509	-0.12543	-0.19897	-0.20085
	0.184	0.1654	0.5504	0.1398	0.0184	0.0173
	140	140	140	140	140	140
T70E	0.08992	0.1121	0.09399	0.13068	0.14402	0.08738
	0.2907	0.1873	0.2693	0.1238	0.0896	0.3046
	140	140	140	140	140	140

	ST90	ST80	ST70	EX90	EX80	EX70
PV90	0.02306	-0.08688	-0.06844	-0.18989	-0.16292	-0.12268
	0.7853	0.3039	0.4217	0.0236	0.0527	0.1487
	142	142	140	142	142	140
PV80	-0.01282	-0.0859	-0.02816	-0.24652	-0.21711	-0.16777
	0.8796	0.3094	0.7412	0.0031	0.0094	0.0476
	142	142	140	142	142	140
PV70	0.03482	-0.11217	-0.07839	-0.28458	-0.29237	-0.25188
	0.6829	0.187	0.3572	0.0007	0.0005	0.0027
	140	140	140	140	140	140
LG90	0.27056	0.3086	0.15104	0.16246	0.168	0.2535
	0.0011	0.0002	0.0749	0.0534	0.0457	0.0025
	142	142	140	142	142	140
LG80	0.2292	0.28056	0.18192	0.203	0.20972	0.27955
	0.0066	0.0008	0.0321	0.0165	0.0132	0.0009
	139	139	139	139	139	139
LG70	0.16123	0.23182	0.19863	0.22403	0.23188	0.28019
	0.0579	0.006	0.0191	0.008	0.006	0.0008
	139	139	139	139	139	139
ST90	1	0.40222	0.21449	-0.40397	-0.3565	-0.20328
	0	0.0001	0.0109	0.0001	0.0001	0.016
	142	142	140	142	142	140
ST80	0.40222	1	0.35327	-0.22198	-0.3	-0.15769
	0.0001	0	0.0001	0.0079	0.0003	0.0628
	142	142	140	142	142	140
ST70	0.21449	0.35327	1	-0.29711	-0.36815	-0.48732
	0.0109	0.0001	0	0.0004	0.0001	0.0001
	140	140	140	140	140	140
EX90	-0.40397	-0.22198	-0.29711	1	0.88501	0.69389
	0.0001	0.0079	0.0004	0	0.0001	0.0001
	142	142	140	142	142	140
EX80	-0.3565	-0.3	-0.36815	0.88501	1	0.81951
	0.0001	0.0003	0.0001	0.0001	0	0.0001
	142	142	140	142	142	140
EX70	-0.20328	-0.15769	-0.48732	0.69389	0.81951	1
	0.016	0.0628	0.0001	0.0001	0.0001	0
	140	140	140	140	140	140

	ST90	ST80	ST70	EX90	EX80	EX70
PRV90	-0.10951	-0.03027	-0.10595	0.36713	0.43197	0.40858
	0.1945	0.7206	0.2128	0.0001	0.0001	0.0001
	142	142	140	142	142	140
PRV80	-0.0703	-0.14742	-0.1858	0.32621	0.41098	0.41226
	0.4058	0.08	0.028	0.0001	0.0001	0.0001
	142	142	140	142	142	140
PRV70	-0.05134	-0.20309	-0.23157	0.20721	0.30097	0.33205
	0.5469	0.0161	0.0059	0.014	0.0003	0.0001
	140	140	140	140	140	140
A90A	-0.14022	-0.07845	-0.02544	-0.00549	0.08379	0.1072
	0.096	0.3534	0.7654	0.9483	0.3215	0.2074
	142	142	140	142	142	140
A80A	-0.14342	-0.09321	-0.02851	-0.02154	0.07229	0.06186
	0.0886	0.2699	0.7381	0.7991	0.3926	0.4678
	142	142	140	142	142	140
A70A	-0.12367	-0.09189	-0.03089	-0.10255	-0.02364	-0.01997
	0.1454	0.2802	0.7171	0.228	0.7816	0.8148
	140	140	140	140	140	140

	PRV90	PRV80	PRV70	A90A	A80A	A70A
DR90	0.08031	0.13602	0.01756	0.39726	0.33688	0.28929
	0.3421	0.1065	0.8368	0.0001	0.0001	0.0005
	142	142	140	142	142	140
DR80	0.09812	0.2147	0.11499	0.42391	0.3903	0.36074
	0.2454	0.0103	0.1761	0.0001	0.0001	0.0001
	142	142	140	142	142	140
DR70	0.07009	0.2022	0.04832	0.41301	0.42815	0.4389
	0.4106	0.0166	0.5708	0.0001	0.0001	0.0001
	140	140	140	140	140	140
CT90	0.10728	0.09632	0.30769	0.00477	-0.06284	-0.11
	0.2038	0.2542	0.0002	0.955	0.4575	0.1958
	142	142	140	142	142	140
CT80	0.14804	0.10877	0.08251	0.08385	-0.00278	-0.08937
	0.0787	0.1976	0.3325	0.3211	0.9738	0.2937
	142	142	140	142	142	140
CT70	0.0457	0.02233	0.00896	-0.08256	-0.13818	-0.23056
	0.5919	0.7934	0.9163	0.3321	0.1035	0.0061
	140	140	140	140	140	140
S90A	0.43764	0.22486	0.17459	-0.18059	-0.21228	-0.24006
	0.0001	0.0071	0.0391	0.0315	0.0112	0.0043
	142	142	140	142	142	140
S80A	0.42843	0.2462	0.21932	-0.1752	-0.2291	-0.28365
	0.0001	0.0031	0.0092	0.037	0.0061	0.0007
	142	142	140	142	142	140
S70A	0.33027	0.24992	0.25924	-0.16977	-0.24937	-0.32469
	0.0001	0.0029	0.002	0.0449	0.003	0.0001
	140	140	140	140	140	140
H90S	0.31822	0.071	0.15737	-0.12688	-0.17562	-0.20854
	0.0001	0.4011	0.0633	0.1324	0.0366	0.0134
	142	142	140	142	142	140
H80S	0.25732	0.12882	0.16761	-0.12704	-0.21023	-0.26662
	0.002	0.1265	0.0478	0.1319	0.012	0.0015
	142	142	140	142	142	140
H70S	0.26627	0.13691	0.11897	-0.07096	-0.18297	-0.29807
	0.0015	0.1067	0.1615	0.4048	0.0305	0.0003
	140	140	140	140	140	140

	PRV90	PRV80	PRV70	A90A	A80A	A70A
R90P	-0.43849	-0.23779	-0.22245	-0.02528	0.01299	0.05223
	0.0001	0.0044	0.0083	0.7652	0.8781	0.54
	142	142	140	142	142	140
R80P	-0.40965	-0.27052	-0.27532	-0.06999	-0.03059	0.01419
	0.0001	0.0011	0.001	0.4078	0.7178	0.8678
	142	142	140	142	142	140
R70P	-0.38278	-0.28877	-0.32239	-0.102	-0.05193	0.02121
	0.0001	0.0005	0.0001	0.2304	0.5423	0.8035
	140	140	140	140	140	140
L90S	-0.16823	-0.0242	-0.02681	0.3909	0.38487	0.36831
	0.0454	0.775	0.7532	0.0001	0.0001	0.0001
	142	142	140	142	142	140
L80S	-0.10843	-0.04436	-0.05377	0.36068	0.41182	0.43123
	0.199	0.6002	0.5281	0.0001	0.0001	0.0001
	142	142	140	142	142	140
L70S	0.06269	0.06911	0.11695	0.39254	0.49391	0.55897
	0.4618	0.4172	0.1688	0.0001	0.0001	0.0001
	140	140	140	140	140	140
UE90	-0.26881	-0.13279	-0.14945	0.11591	0.08798	0.02518
	0.0012	0.1152	0.078	0.1695	0.2978	0.7678
	142	142	140	142	142	140
UE80	-0.33175	-0.20626	-0.25002	0.15146	0.14185	0.10211
	0.0001	0.0138	0.0029	0.072	0.0922	0.23
	142	142	140	142	142	140
UE70	-0.17738	-0.07421	-0.08642	0.11734	0.12959	0.12495
	0.036	0.3835	0.31	0.1674	0.127	0.1413
	140	140	140	140	140	140
T90E	0.25773	-0.00751	0.02884	-0.17887	-0.15116	-0.06467
	0.002	0.9293	0.7352	0.0332	0.0725	0.4478
	142	142	140	142	142	140
T80E	0.01298	-0.21493	-0.14692	-0.31303	-0.25083	-0.09675
	0.879	0.0108	0.0832	0.0002	0.0028	0.2555
	140	140	140	140	140	140
T70E	0.20126	-0.0572	0.07094	-0.21277	-0.2524	-0.27949
	0.0171	0.5021	0.4049	0.0116	0.0026	0.0008
	140	140	140	140	140	140

	PRV90	PRV80	PRV70	A90A	A80A	A70A
PV90	-0.20868	0.01323	-0.09452	0.283	0.27574	0.21652
	0.0127	0.8758	0.2666	0.0006	0.0009	0.0102
	142	142	140	142	142	140
PV80	-0.10328	0.07488	-0.04808	0.49208	0.52127	0.51132
	0.2213	0.3758	0.5727	0.0001	0.0001	0.0001
	142	142	140	142	142	140
PV70	-0.10013	0.03211	-0.06835	0.27879	0.3786	0.46392
	0.2391	0.7064	0.4223	0.0009	0.0001	0.0001
	140	140	140	140	140	140
LG90	0.18366	-0.03113	-0.01018	-0.04868	-0.15039	-0.22515
	0.0287	0.7131	0.905	0.5651	0.074	0.0075
	142	142	140	142	142	140
LG80	0.16681	-0.03848	-0.01118	-0.03398	-0.16339	-0.24955
	0.0497	0.6529	0.8961	0.6913	0.0546	0.0031
	139	139	139	139	139	139
LG70	0.12936	-0.04371	-0.02202	-0.01062	-0.15142	-0.25149
	0.1291	0.6094	0.7969	0.9013	0.0752	0.0028
	139	139	139	139	139	139
ST90	-0.10951	-0.0703	-0.05134	-0.14022	-0.14342	-0.12367
	0.1945	0.4058	0.5469	0.096	0.0886	0.1454
	142	142	140	142	142	140
ST80	-0.03027	-0.14742	-0.20309	-0.07845	-0.09321	-0.09189
	0.7206	0.08	0.0161	0.3534	0.2699	0.2802
	142	142	140	142	142	140
ST70	-0.10595	-0.1858	-0.23157	-0.02544	-0.02851	-0.03089
	0.2128	0.028	0.0059	0.7654	0.7381	0.7171
	140	140	140	140	140	140
EX90	0.36713	0.32621	0.20721	-0.00549	-0.02154	-0.10255
	0.0001	0.0001	0.014	0.9483	0.7991	0.228
	142	142	140	142	142	140
EX80	0.43197	0.41098	0.30097	0.08379	0.07229	-0.02364
	0.0001	0.0001	0.0003	0.3215	0.3926	0.7816
	142	142	140	142	142	140
EX70	0.40858	0.41226	0.33205	0.1072	0.06186	-0.01997
	0.0001	0.0001	0.0001	0.2074	0.4678	0.8148
	140	140	140	140	140	140

	PRV90	PRV80	PRV70	A90A	A80A	A70A
PRV90	1	0.6131	0.42355	0.28496	0.28474	0.26683
	0	0.0001	0.0001	0.0006	0.0006	0.0014
	142	142	140	142	142	140
PRV80	0.6131	1	0.488	0.3626	0.37495	0.3521
	0.0001	0	0.0001	0.0001	0.0001	0.0001
	142	142	140	142	142	140
PRV70	0.42355	0.488	1	0.18465	0.18767	0.1779
	0.0001	0.0001	0	0.029	0.0264	0.0355
	140	140	140	140	140	140
A90A	0.28496	0.3626	0.18465	1	0.96501	0.89837
	0.0006	0.0001	0.029	0	0.0001	0.0001
	142	142	140	142	142	140
A80A	0.28474	0.37495	0.18767	0.96501	1	0.96553
	0.0006	0.0001	0.0264	0.0001	0	0.0001
	142	142	140	142	142	140
A70A	0.26683	0.3521	0.1779	0.89837	0.96553	1
	0.0014	0.0001	0.0355	0.0001	0.0001	0
	140	140	140	140	140	140

DESCRIPTION OF VARIABLE SYMBOLS

VARIABLE	DESCRIPTION
DR90	Dropout Rate, 1990
DR80	Dropout Rate, 1980
DR70	Dropout Rate, 1970
CT90	Continuing Education %, 1990
CT80	Continuing Education %, 1980
CT70	Continuing Education %, 1970
S90A	% Symbolic Analysts, 1990
S80A	% Symbolic Analysts, 1980
S70A	% Symbolic Analysts, 1970
H90S	% High-Skill Service, 1990
H80S	% High-Skill Service, 1980
H70S	% High-Skill Service, 1970
R90P	% Routine Producers, 1990
R80P	% Routine Producers, 1980
R70P	% Routine Producers, 1970
L90S	% Low-Skill Service, 1990
L80S	% Low-Skill Service, 1980
L70S	% Low-Skill Service, 1970
UE90	Unemployment Rate, 1990
UE80	Unemployment Rate, 1980
UE70	Unemployment Rate, 1970
T90E	CHG Total Employment, 1980-1990
T80E	CHG Total Employment, 1970-1980
T70E	CHG Total Employment, 1960-1970
PV90	% Families in Poverty, 1990
PV80	% Families in Poverty, 1980
PV70	% Families in Poverty, 1970
LG90	Largest High School, 1990
LG80	Largest High School, 1980
LG70	Largest High School, 1970
ST90	Student-Teacher Ratio, 1990
ST80	Student-Teacher Ratio, 1980
ST70	Student-Teacher Ratio, 1970
EX90	Expenditures Per Pupil, 1990
EX80	Expenditures Per Pupil, 1980
EX70	Expenditures Per Pupil, 1970
PRV90	% in Private Schools, 1990
PRV80	% in Private Schools, 1980
PRV70	% in Private Schools, 1970
A90A	% African-American, 1990
A80A	% African-American, 1980
A70A	% African-American, 1970

APPENDIX C

NONMETROPOLITAN SCHOOL DISTRICTS - DESCRIPTIVE STATISTICS

Table C.1 Descriptive statistics of educational attainment variables for nonmetropolitan school districts

Variable Name	N	Mean	Standard Deviation	Minimum Value	Maximum Value
Dropout Rate, 1970	85	4.98	1.65	0.8	8.7
Dropout Rate, 1980	85	5.07	1.50	2.0	8.7
Dropout Rate, 1990	85	3.31	1.26	0.0	6.0
Continuing Education, 1970	85	51.87	12.01	24.0	83.0
Continuing Education, 1980	85	48.53	11.15	27.0	80.0
Continuing Education, 1990	85	68.24	12.26	40.0	94.0

Table C.2 Descriptive statistics of occupational variables for nonmetropolitan school districts

Variable Name	N	Mean	Standard Deviation	Minimum Value	Maximum Value
% Symbolic Analysts, 1970	85	11.15	3.81	3.3	22.7
% Symbolic Analysts, 1980	85	11.70	2.87	6.2	20.4
% Symbolic Analysts, 1990	85	14.02	3.74	8.03	25.68
% High-Skill Services, 1970	85	22.28	5.54	11.0	37.5
% High-Skill Services, 1980	85	24.23	5.39	11.3	38.0
% High-Skill Services, 1990	85	20.27	3.57	13.9	30.1
% Low-Skill Services, 1970	85	25.53	4.97	17.3	39.3
% Low-Skill Services, 1980	85	33.23	4.72	22.8	44.8
% Low-Skill Services, 1990	85	38.05	4.04	27.8	47.5
% Routine Producers, 1970	85	37.09	8.49	14.3	54.4
% Routine Producers, 1980	85	27.16	7.12	12.45	44.0
% Routine Producers, 1990	85	24.52	6.64	9.8	39.0

Table C.3 Descriptive statistics of unemployment rate, total employment and job creation for nonmetropolitan school districts

Variable Name	N	Mean	Standard Deviation	Minimum Value	Maximum Value
Unemployment Rate, 1970	85	3.67	1.90	.7	12.4
Unemployment Rate, 1980	85	6.10	1.82	3.3	10.6
Unemployment Rate, 1990	85	5.47	2.39	1.1	13.8
Total Employment, 1960	85	5371.71	3317.84	1025	15518
Total Employment, 1970	85	5966.74	4252.08	871	22231
Total Employment, 1980	85	7804.11	5916.53	1257	28437
Total Employment, 1990	85	9088.09	7345.77	1273	33713
ΔTotal Employment, 1960-1970	85	.0589	.1547	-0.64	0.38
ΔTotal Employment, 1970-1980	85	.2041	.1233	-0.14	0.58
ΔTotal Employment, 1980-1990	85	.1001	.1420	-0.28	0.50

Table C.4 Descriptive statistics of families in poverty for nonmetropolitan school districts

Variable Name	N	Mean	Standard Deviation	Minimum Value	Maximum Value
% Families in Poverty, 1970	85	19.17	7.04	5.7	39.5
% Families in Poverty, 1980	85	11.88	3.74	5.5	21.3
% Families in Poverty, 1990	85	11.23	4.66	2.5	25.3

Table C.5 Descriptive statistics of school quality measures for nonmetropolitan school districts

Variable Name	N	Mean	Standard Deviation	Minimum Value	Maximum Value
Student-Teacher Ratio, 1970	85	18.63	1.89	14.2	23.1
Student-Teacher Ratio, 1980	85	13.94	1.53	9.7	17.9
Student-Teacher Ratio, 1990	85	11.97	1.85	6.7	17.2
Per Pupil Expenditures, 1970	85	2158.00	208.80	1762	2695
Per Pupil Expenditures, 1980	85	2996.15	394.75	2336	4343
Per Pupil Expenditures, 1990	85	4619.74	591.76	3807	7807
% in Private Education, 1970	85	4.29	7.47	0.1	42.1
% in Private Education, 1980	85	5.10	4.62	0.1	18.2
% in Private Education, 1990	85	5.23	3.44	0.5	16.1
Largest High School, 1970	85	793.14	363.21	218	2017
Largest High School, 1980	85	762.35	339.42	175	1751
Largest High School, 1990	85	732.11	356.99	131	2034

METROPOLITAN SCHOOL DISTRICTS - DESCRIPTIVE STATISTICS

Table C.6 Descriptive statistics of educational attainment variables for metropolitan school districts

Variable Name	N	Mean	Standard Deviation	Minimum Value	Maximum Value
Dropout Rate, 1970	49	4.22	1.54	1.3	7.3
Dropout Rate, 1980	51	5.58	2.64	1.6	15.8
Dropout Rate, 1990	51	3.43	1.82	0.0	8.3
Continuing Education, 1970	49	59.12	11.79	30.0	79.0
Continuing Education, 1980	51	57.61	13.80	31.0	82.0
Continuing Education, 1990	51	76.65	10.94	47.0	94.0

Table C.7 Descriptive statistics of occupational variables for metropolitan school districts

Variable Name	N	Mean	Standard Deviation	Minimum Value	Maximum Value
% Symbolic Analysts, 1970	49	16.42	7.18	5.5	35.0
% Symbolic Analysts, 1980	51	17.49	6.99	7.7	38.4
% Symbolic Analysts, 1990	51	21.93	8.86	8.1	47.8
% High-Skill Services, 1970	49	31.75	7.89	15.7	46.5
% High-Skill Services, 1980	51	32.73	5.80	19.4	42.3
% High-Skill Services, 1990	51	24.83	3.90	15.6	33.1
% Low-Skill Services, 1970	49	23.67	7.17	10.8	51.8
% Low-Skill Services, 1980	51	29.52	5.53	16.1	40.2
% Low-Skill Services, 1990	51	35.76	6.01	22.2	49.5
% Routine Producers, 1970	49	26.78	9.58	8.0	51.8
% Routine Producers, 1980	51	19.10	7.43	5.8	38.8
% Routine Producers, 1990	51	16.22	6.44	4.7	34.1

Table C.8 Descriptive statistics of unemployment rate, total employment and job creation for metropolitan school districts

Variable Name	N	Mean	Standard Deviation	Minimum Value	Maximum Value
Unemployment Rate, 1970	49	2.75	1.03	0.7	5.7
Unemployment Rate, 1980	51	4.86	1.66	2.1	8.0
Unemployment Rate, 1990	51	4.60	1.96	2.1	9.4
Total Employment, 1960	49	21150.16	27260.25	1499	128851
Total Employment, 1970	49	28193.65	37230.75	1977	186147
Total Employment, 1980	51	35799.47	51888.33	3007	318367
Total Employment, 1990	51	46556.27	75690.85	3121	480550
ΔTotal Employment, 1960-1970	49	0.2318	.1533	-0.17	0.56
ΔTotal Employment, 1970-1980	49	.2406	.1788	-0.21	0.54
ΔTotal Employment, 1980-1990	51	.1700	.1537	-.10	0.52

Table C.9 Descriptive statistics of families in poverty for metropolitan school districts

Variable Name	N	Mean	Standard Deviation	Minimum Value	Maximum Value
% Families in Poverty, 1970	49	12.15	6.43	3.2	28.4
% Families in Poverty, 1980	51	8.53	4.06	1.7	19.6
% Families in Poverty, 1990	51	7.44	4.82	1.8	17.4

Table C.10 Descriptive statistics of school quality measures for metropolitan school districts

Variable Name	N	Mean	Standard Deviation	Minimum Value	Maximum Value
Student-Teacher Ratio, 1970	49	18.65	1.95	12.9	22.5
Student-Teacher Ratio, 1980	51	13.98	1.55	9.8	18.7
Student-Teacher Ratio, 1990	51	11.56	2.28	7.0	19.0
Per Pupil Expenditures, 1970	49	2413.41	555.31	1812	4440
Per Pupil Expenditures, 1980	51	3419.04	888.06	2476	6433
Per Pupil Expenditures, 1990	51	5133.04	1180.85	3828	8724
% in Private Education, 1970	49	5.17	5.27	0.2	25.9
% in Private Education, 1980	51	6.51	5.16	0.1	21.8
% in Private Education, 1990	51	7.27	4.07	0.9	19.8
Largest High School, 1970	49	1403.39	654.69	325	2994
Largest High School, 1980	49	1372.18	612.83	435	3063
Largest High School, 1990	51	1310.80	663.82	296	3132

VITA

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