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Educational Attainment, Economic Progress, and the Goals of Education in Rural Communities

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Much educational policy rhetoric rests on the assumption that educational investments serve regional, state, and national economic ends. This article addresses the nature of the relationship between educational achievement, as reflected in overall attainment, and economic progress. Census data for 1940-1990 are used to analyze the relationship. Findings provide a basis for questioning the validity of policy positions that offer education as a means to improve economic conditions. Results are inconsistent with the policy assumption that investing in education will lead to economic increases, particularly for rural and low-income states. Discussion suggests that noneconomic goals, such as fostering community development should be given much more weight in educational policy discussions.

Student: Why should I study?
Parent: So that you will make good grades.
Student: Why should I make good grades?
Parent: So that you can get a good job and be successful.

This fictional exchange highlights a pervasive cultural assumption, held by many parents and students, that the primary purpose of education is to get a job. Emphasizing the need for economic outcomes is not unique to parents and students. These same presumptions are at the center of educational policy discussions at the national and regional levels. Nationally, the Goals 2000 initiative states that each student's education should produce "the knowledge and skills necessary to compete in a global economy" (Sadker & Sadker, 1997, p. 154). While producing greater job marketability for the individual student has visceral appeal, the implications of this goal are troubling. Tying a student's achievement (knowledge and skills) to an economic outcome (competing in the global economy) places economic considerations in a position to dominate educational decision-making. In addition, emphasizing the idea that the purpose of school is to help students "compete in a global economy" has implications well beyond simply securing a job and becoming a productive worker. It implies that both the individual student and the student's knowledge represent a vehicle for making a national economy competitive in the larger world market. Worse, this economism enables student achievement and educational attainment to function as a policy pawn for addressing national economic issues.

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Prevalent Assumptions

In his 1997 State of the Union address, U.S. President Clinton stated, "We have brought new economic growth by investing in our people . . ." (Clinton, 1997a, p. 136). Later in the speech, the President indicated that the investment strategy is to provide additional resources for the acquisition of more education. In linking the nation's economic progress to increased education, the President implied that economic growth is a function of the citizenry's education level. The President repeated the same theme several other times in 1997 and 1998. In addressing the AFL-CIO convention, he stated that his administration had created a new economic policy for the country during his time in office. A cornerstone of that policy had been "investing in [the American people's] education" (Clinton, 1997c, p. 1402). The United States-Brazil Partnership for Education amplified the importance attached by the administration to education in any nation's economic development, as the following excerpt from the U.S.-Brazil agreement indicated: "Literacy and a first class educational foundation are critical determinants to . . . the strength of our economies" (Clinton, 1997b, p. 1580). This was followed later by the administration's most direct statement of its view on education's role in a nation's economic progress. On a trip to Africa, the President announced a $120 million initiative to expand educational opportunity for Africans. "Spurring economic growth" represented one of the anticipated outcomes of this program (Clinton, 1998, p. 491). In each of these instances, our nation's leader and primary policy architect asserted a universally applicable causal connection between education and economic growth.

Few people would argue with the supposition that education is important to personal development and can make an individual more competitive in the job market—economics at the individual level. However, the President does

not seem to be articulating this point. Rather, he presents education as the key to the economic well-being of a nation and suggests that economic gains can be achieved through investing in the education of a country's citizens.

National policymakers, however, do not have a monopoly on presuming that increased educational levels will lead to economic progress. The presumption exists in policy pronouncements at the regional level as well. A study commission on the future of the U.S. South identified education as the key element in the economic competitiveness and growth of that region. As the 1998 Commission on the Future of the South noted, "In the new economy, these are the foundation elements of an effective economic development program—more rigorous education in K-12 . . ." (Commission on the Future of the South, 1998, p. 21). Professional organizations, too, contribute to the rhetoric of offering education level or spending as a key to economic development. The NEA for example, has argued that "investments in education should have a beneficial effect on long-term economic health" (NEA, 1995, p. 18). The statements presented and the positions described represent national political figures, high profile regional study commissions, and professional education groups promoting education as a vehicle for economic growth.

Problem Statement and Approach

The popular belief concerning the link between education and the economy rests on a causal assumption that investing in education will lead to economic increases. This link rests on two primary suppositions: (a) that the purpose of education is to serve economic ends, and (b) that formal education drives the economy rather than the reverse. These suppositions place the onus on schools since failures of the economy will be attributed to schools.[1] These beliefs regarding the relation between schools and economies are grounded in dominant cultural assumptions about schooling that do not consider alternative purposes for school such as community-building. Those in the most prominent positions to generate and influence policy seem to be preaching the same message, but how valid is this message? How valid is the position that increasing education spurs economic development?

This query serves as the focus for the present article. Specifically, what is the nature of the relationship that exists between educational level and economic progress, as reflected in per capita income? The answer will shed light on the primary issue regarding the educational achievement of students in rural places, i.e., whether more formal education leads to economic well-being (or vice-versa). We will address this issue by providing an overview of the existing research evidence, by presenting some of the historical and cultural foundations of the assumed link between education and the economy, and by analyzing census data.

Relevant Literature

To begin, we differentiate between the effects of education on the economic well-being of an individual and its effects on an aggregate such as a nation, a state, or a community. In other words, there are actually two different issues here: (a) whether higher levels of education lead to economic payoffs for individuals and (b) whether increased education leads to greater economic prosperity for a nation or a community.

To study the economic effects of education for individuals, economists have traditionally used individual rate-of-return analyses, which investigate the extent to which an individual's investment in education yields higher personal income or some other measure of improved economic standing. A thorough review of such studies is provided by Psacharopoulos (1989). Most studies of this type have shown some relationship between educational level and personal income; on the average, as DeYoung (1989) notes, workers who are more highly educated tend to get higher wages. DeYoung also points out, however, that the general trend does not hold for all classes of workers, and that conflicting results exist within this body of research.

Even if we accept the empirical evidence supporting the positive return of investment in education for individuals, exhorting everyone to obtain more education for economic reasons is logically problematic. More education helps individuals get jobs only if there are enough jobs to go around, and only if the skills obtained through education are the skills actually required by those jobs. Education tends to make individuals more competitive for existing jobs, but educating greater numbers of people may actually reduce the returns on investment for those who compete unsuccessfully. As more and more people acquire educational credentials, the value of these credentials is likely to decrease (Green, 1980). This fate has clearly overtaken the high school diploma.

While parents naturally respond to and use individual-level arguments about the value of education for their children, the rhetoric of would-be policymakers is dominated primarily by arguments about the effects of education on the economy of the nation, a state, or a community—economics at the aggregate level. At this level, a number of studies have been conducted to determine the contribution of education to measures of national economic prosperity, such as gross national product (GNP) or per capita income. The overall body of evidence is not very convincing. As Rubinson and Fuller (1992) note, the pattern of effects is "seemingly random," (p. 103), and results of such studies "have not been as strong, uniform, or consistent as might

[1]The successes of the economy are more frequently attributed directly to business acumen and will.

be expected . . ." (pp. 102-103). As an example, Rubinson and Fuller call attention to a cross-national study by Benavot (1992), which they refer to as "typical" (p. 103). Benavot found that education did seem to have some effect on economic growth, but the effects were smaller than other influences on economic growth. Further, the effects were inconsistent across different levels of schooling, as well as across time periods.

Even when researchers claim to have found empirical support for the effects of education on the economy at the aggregate level, these claims are not indisputable. First, claims can be exaggerated, and often are. Most such studies employ correlational procedures, which provide information only about the strength of the associations between variables, not the direction of causality. Textbooks typically advise caution in interpreting correlational research, especially if one wishes to make inferences about causality. As DeYoung (1989) suggests, it would be just as feasible to argue that economic growth rates led to greater educational attainment in the twentieth century.

There is another, perhaps even more important reason why results from these studies are open to question. The econometric models that form the bases for these studies are motivated by underlying theory. In other words, the mathematical modeling of the relationships among variables is based on theoretical assumptions and beliefs about the ways in which those relationships should operate. For example, in rate-of-return analyses, researchers must often assign mathematical weights ("correction factors") to their calculations; these factors are determined in an a priori manner, which some critics might even call arbitrary. At best, the models represent reasonable tentative explanations of the ways in which economic processes might operate, based in large part on the specific economic theory to which the researcher subscribes.

Until the 1970s, most research on the relationship of education and the economy was guided by human capital theory. Assuming economic models based on human capital theory, a number of researchers claimed to have found support for the position that education increases national economic growth. During the last 20 years, however, prevailing ideas about human capital theory have been challenged with increasing frequency and force. Since the empirical findings are subject to interpretation based on one's theoretical orientation, and since the dominant theoretical orientations tend to change over time, we next provide a historical overview of the ways in which these ideas have changed. These are not just trends in economic thought: They are trends in our basic philosophy of schooling and the purposes it should serve.

Historically, two main themes have emerged regarding the purpose of education. One popular assumption views the purpose of schools as preserving the status quo and preparing students for the work force, while the second views the purpose of schooling in intellectual, political, and ethical terms as creating critical thinkers and members of a participatory democracy. Schools have not always been blamed for economic ups and downs, but were seen as a vehicle for social control (Katz, 1968; Nasaw, 1979) and moral conditioning (McClellan, 1985; Reese, 1983).

The Great Depression was a key turning point for the schools. Schools then were not blamed for the crash; business practices were seen as the cause. Increasingly thereafter, however, schools were held responsible for economic failures. Business models and practices simultaneously seeped into the fabric of schooling (DeYoung, 1989; Tyack, Lowe, & Hansot, 1984). By the 1940s, business and management models dominated cultural beliefs concerning the purpose of schools and their organizational structures (Berliner, 1993; Karier, Violas, & Spring, 1973). Not many would disagree that the purpose of schools is to prepare our students for the "world of work." At issue in this change, however, is that dominant assumptions concerning economic development exclude other important educational outcomes from educational policy discussions. These include the cultivation of freethinking citizens and individuals who can foster local community (cf. Dewey, 1916/1966, 1944). The marginalization of these outcomes might well be (and has been) construed as an attack on democracy and community (e.g., Theobald, 1997).

The historical evolution of schooling has been dominated by urban school concerns (DeYoung & Lawrence, 1995). Perhaps this stems from the economic diversity and the economic influence of urban areas, but the specific needs of rural communities assume distinctly secondary importance under the rubric of national economic development. The quest for additional funding for public schools has produced some predictable policy perspectives related to the ideology of national economic development. One is that schools are responsible for the economy and that the improved schools will improve economic outlook (even in rural regions). This perspective reinforces the cultural tendency to blame schools for economic woes, and deflects possible concern over the influence of economic and social injustice in the schools (Berliner, 1993; Berliner & Biddle, 1995).

While economic improvement is a worthy goal, its use in rural schooling is arguably more problematic than in urban and suburban schooling. Increasing urbanization and industrialization over the past century have led to a massive population migration to the cities, leaving many rural communities with ever smaller populations and dwindling prospects (DeYoung & Lawrence, 1995). Educational attainment for many rural students often means that they will leave their communities to find employment elsewhere, thereby weakening business prospects for rural areas (Broomhall & Johnson, 1994). Rural interests highlight the importance of the local context—such as family, commu-

nity, and place—in improving schools (Herzog & Pittman, 1995; Theobald & Nachtigal, 1995).

The particular concerns and needs facing rural schools are absent from the national rhetoric of school reform. While the publication of A Nation at Risk articulated numerous concerns about the need to improve schools, the concerns reflected the conditions of urban schooling, and they were motivated by fear of a declining U.S. role in the global economy. In fact, national and state educational reform agendas tend to conflate urban and rural school concerns, with urban needs taking center stage. Rural school concerns with fostering and protecting their surrounding communities are strikingly absent and ignored from the vantage that schools serve to develop the national economy (Theobald, 1997).

To this point in our discussion, it is clear that educational attainment provides a major focus for policymakers. It should also be clear that such a policy focus cannot serve all interests and all communities equally well, and that the position of rural communities may be at risk when national economic development takes precedence. Finally, research evidence lends some support for education construed as an economic catalyst, but equally strong evidence suggests the need for caution or even resistance, especially in rural areas. Where does that leave us? Policy statements commonly champion education as a vehicle for promoting economic ends; the business model has been applied to education for at least 60 years; and just enough research evidence exists to tantalize us, but not enough exists to discredit policies that construe education principally as a means to national economic victory.

The purpose of our research effort was to identify additional information regarding the relationship between education attainment and economic outcomes and to use the findings to address the larger question of whether economic progress is a worthy (or even reasonable) object of improved educational attainment in rural areas.

Method

Rationale for the Analysis

Even the casual observer of educational and economic trends over the past century would acknowledge that the national levels of both had advanced steadily. However, simultaneous gains hardly justify the use of economic competitiveness as a rationale for educational achievement. Education gains may lead to economic gains; economic gains may lead to education gains; or gains in both areas may be brought about by other changes in society. Thus, to resolve whether or not economic improvement ensues from improved education levels, we must unravel an academic "chicken or egg" puzzle. Cook and Campbell (1979), in a discussion of causal inference, best describe the logic underlying our study. "The aim is to discover points in the causal chain where changes in one variable lead to changes in another" (p. 36). Only if increases in education level precede increases in income level can education level be responsible for or partially responsible for increases in economic level. If higher levels of educational attainment do not precede economic gains, however, then using a national or regional economic outcome as one of the foci for individual student educational attainment would be unwarranted.

Sample and Variables

We drew on 1940-1990 U.S. Census data, aggregated by state, for investigating our research problem. We used state level data because public education is the province of the individual states, and policy determining the direction of public education must be enacted initially at the state level. Thus, outcomes from policy initiatives would be theoretically observable using data from that macro level. The year 1940 provided a beginning point for the data because educational level, one of the variables pertinent to the study, appeared in a retrievable form initially with that census.

Given our research question, the major variables comprised the percentage of the adult population classified as having finished high school, the percentage of the adult population with a bachelor's degree, and per capita income. Two educational variables—high school and college attainment—were used as opposed to a single median years of education, because Killian and Parker (1991) reported different relationships between each of these variables and income level. In our investigation, per capita income operationally defined economic attainment and served as a proxy for economic progress.

Since our study rests upon determining the temporal sequence of relative changes in education and income, we began the analysis by looking historically at education and income trends of different states. Rural and nonrural states were selected because of the differential economic growth observed in these areas over the past half century. We determined locale by state using census data on the percentage of the population classified as living in urban or metropolitan areas. The states included in the analyses were classified as being among the most rural (top 33 to 35%) in 1940 and also in 1990. Likewise, the states that were the most nonrural, using the same 33 to 35% criterion, for the 2 years mentioned above were identified. This selection method identified states that were consistently rural and nonrural, relative to each other, and thus reduced the influence of other variables, e.g., radical population shifts relative to other states. Eleven states were identified as being consistently among the most rural across the designated time span and 12 states among the most nonrural.

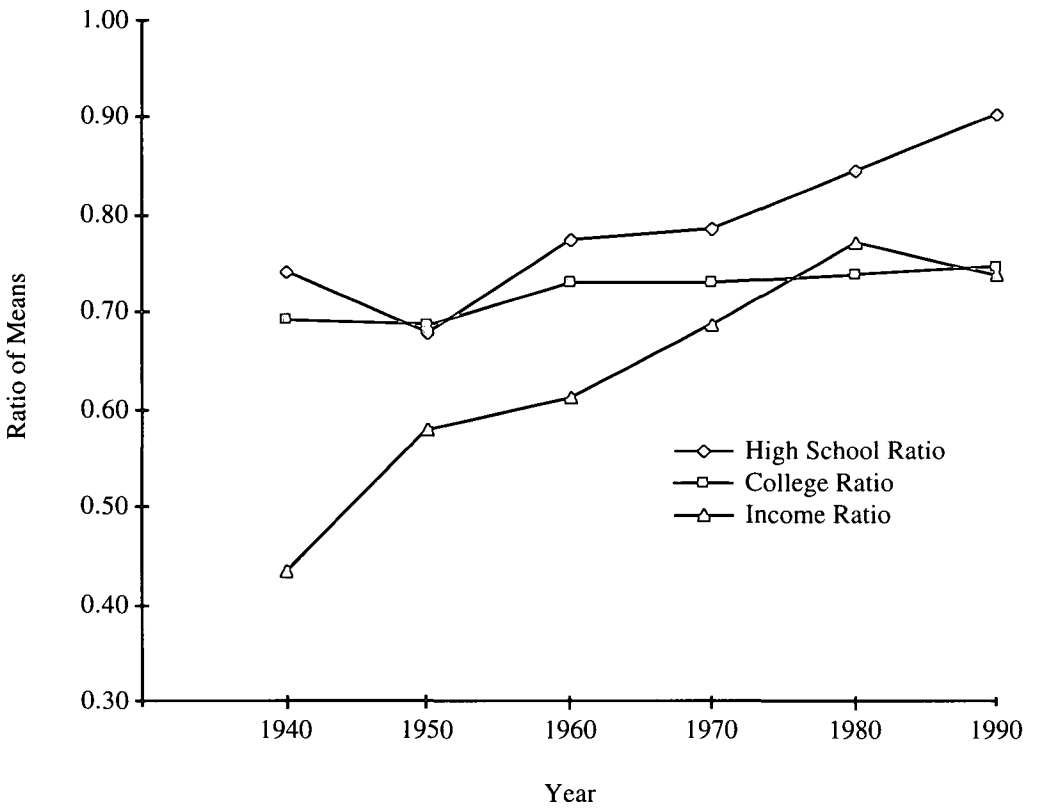

Figure 1. Trends in the ratio of mean education and income for rural/nonrural states.

Analysis Approach

Trends in the educational variables and the economic variable for these rural and nonrural areas were explored by plotting the data for the variables across each of the 6 censuses between 1940 and 1990. The graphical method of analyzing the trends was based upon a suggested approach for short time series offered in Cook and Campbell (1979). More conventional ARIMA[2] procedures were not appropriate due to the small number of data points (6) in each series. Likewise, regression analysis was not used because there was no single dependent variable and developing a regression equation for each census year would not provide information about the relative changes in the variables across years. Plots were generated for education and income trends across the 6 census years. Given the initial results, additional trend line plots were produced which involved lagging variables, producing separate plots for rural and nonrural states, and producing plots for states classified on the 1940 income level. In the plots involving lagged variables, the lag interval was one census period. That is, if per capita income were lagged, then the 1940 educational variables would be plotted against the 1950 per capita income variable.

[2]AutoRegressive Integrated Moving Average.

Results and Discussion

In the first set of comparisons, we examined the relationship between educational attainment and income as evidenced in the trends for these variables over the period from 1940 to 1990. In developing the trend lines, we needed to portray not just the simple trends, but the trends in the education and income variables in a relative sense, i.e., how the trend in educational attainment changed relative to the trend in income. By simple trends, we mean a plot of the raw census data over the 60-year period for a selected variable for both rural and nonrural states. From such simple trend lines we could determine how changes in a single variable for rural states, e.g., per capita income, changed relative to per capita income for nonrural states. Using this approach, we could not easily compare trends in income with trends in education, a variable described on a different numerical scale. We needed to express education and income in a common metric, and the rural versus nonrural graphical comparison needed to be as simple as possible; hence we constructed relative trend lines. In developing

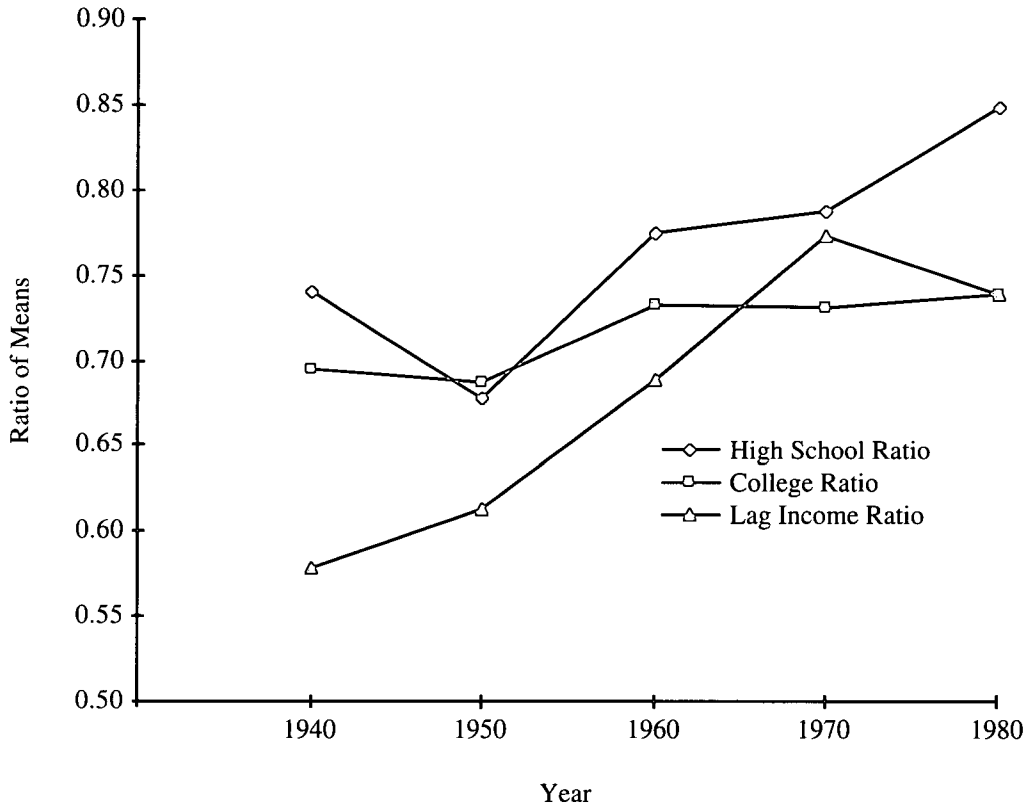

Figure 2. Trends in the ratio of mean education and lagged income rural/nonrural states.

these relative trend lines, we expressed the various figures for the rural states as a ratio of the corresponding figure for the nonrural states for each census year. For example, the per capita income for 1940, averaged across the 11 most rural states, was approximately $400. This figure represents .55 of the $726 mean per capita income for the 12 most nonrural states. Similar proportions were computed for each variable for each census year. They represented the relative amount of education and income in the most rural states in comparison to nonrural states. As such, they described both the position for the census year and the comparison to the other set of states.

Figure 1 contains the plot for the education variables and per capita income. As can be seen, the ratio of the percent of adults graduating from college in the rural states to the percent of college graduates in nonrural states increased only slightly from 1940 to 1990; the level of college graduation in rural states was about 70% of that in nonrural states over this period. Meanwhile, rural states gained steadily in per capita income relative to nonrural states until 1980, when they began to again lose ground. The relative position of the rural states with regard to high school graduates dropped sharply from 1940 to 1950, then began to climb. Overall, the patterns show no clear relationship among the three variables. Increases in the educational variables coincided with income increases some census years, but for others, increases in one were linked to decreases in the other. This suggests that if education is part of the causal chain leading to economic progress, then its function is not a straightforward one.

Policymakers and policy generating bodies seem to assume that educational attainment and economic progress are linked in a causal chain. Given the results from our first analysis, we explored further the possibility of a cause-and-effect relationship between education and income, and the direction of probable causation, if it existed. The existence of a potential causal link dictates that changes in the "cause" variable must chronologically precede changes in the "effect" variable, rather than occurring at the same point in time. Therefore, the possibility existed that if educational attainment produced economic progress, then changes in income might not be immediately observed, but would be evident at some later point in time. The possibility of this scenario was addressed using the same graphical approach as before, but in this instance income was lagged (Figure 2). In producing the plot, education data for 1940 were plotted against income data for 1950. Similar lags were used for each of the other census years. A clear trend in this

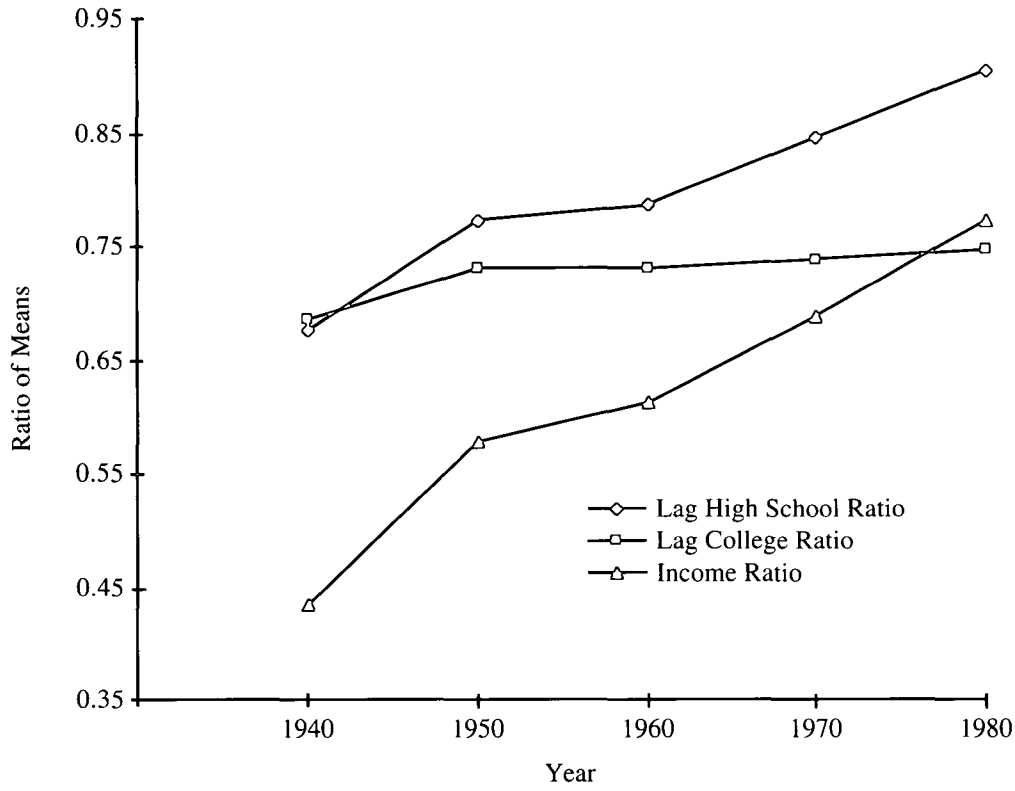

Figure 3. Trends in the ratio of mean income and lagged education rural/nonrural states.

situation would suggest that changes in education level are associated with subsequent changes in income; such a result would strongly support the economic development interpretation of human capital theory and the current stance taken by most policymakers. Figure 2 magnifies the lack of a pattern observed in the first plot. In this case, as before, increases in relative education were associated with increases in income for some census periods and with decreases at others. There is little, if any, evidence in these first two plots to suggest that educational attainment results in economic progress. As Glass, Willson, and Gottman (1975, p. 6) stated, "If two series are uncorrelated it is unlikely they are causally connected."

Given the results from the first two plots and the common knowledge that income and education are in fact correlated, we explored the reversed causality hypothesis—that income changes lead to educational changes. For this analysis, both of the education variables were lagged. A clear trend in this case would imply that economic growth is an inappropriate goal of education policy at least in practical, if not rhetorical, terms.

Figure 3 provides evidence to determine whether the relative standing of rural states with regard to income at each census year was associated with their relative standing with regard to education level 10 years later. In this plot, a clear trend emerges for the first time: The trend lines for income ratio and for lagged high school ratio are nearly parallel throughout the period from 1940 to 1980. Although the college graduation ratio remained relatively stable during this entire time period, both the income ratio and the high school ratio increased considerably. Remarkably, the slopes of the line segments connecting each set of data points are almost equal for the income and lagged high school variables. In other words, the amount by which rural states increased their relative economic standing during each 10-year period was almost equal to the amount by which they increased their relative educational standing during the next 10-year period. Thus, it appears that changes in the economy are arguably related to subsequent changes in the relative high school graduation rate. The observed sequence is more supportive of job competition theory (Wanner & Lewis, 1982) than it is of human capital theory at the macro level. The following conditions may explain the observed trend: (a) increased personal wealth provides resources for the acquisition of education, (b) developed industry uses education as a screening device for employees (job competition theory), and (c) developed industry, necessitating a more highly educated work force produces

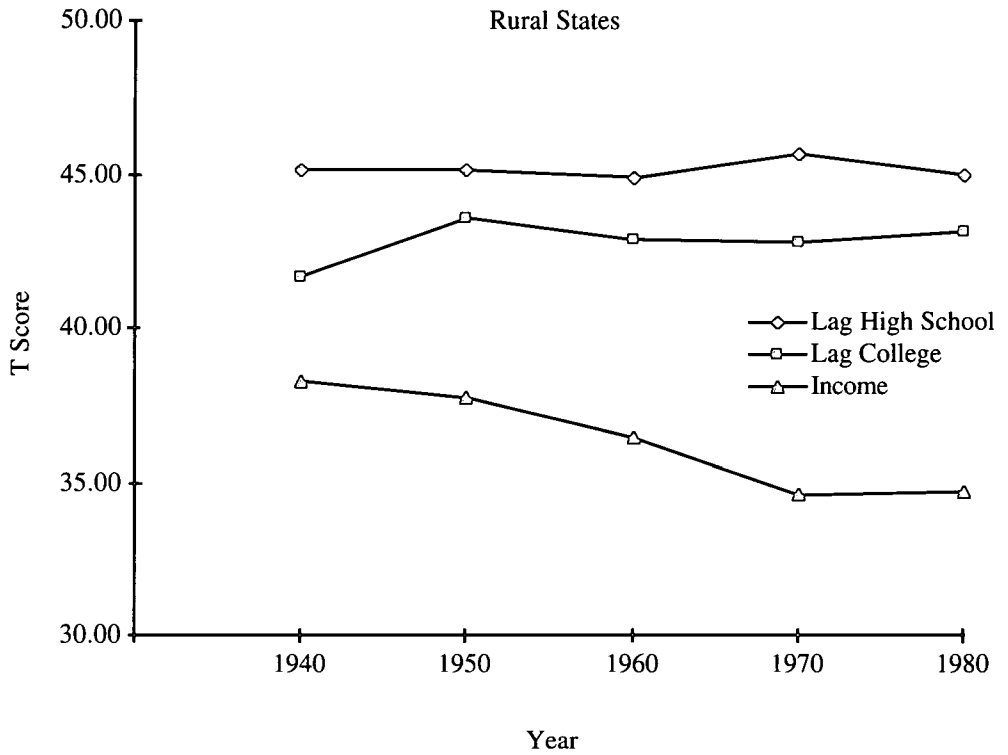

Figure 4. Income and lagged education trends for rural states.

a migration of educated workers from areas of less economic development. While "concomitant variation does not necessarily imply causation" (Glass et al., 1975, p. 6), our results thus far are more suggestive that economic progress leads to educational advancement, rather than the reverse.

We conducted a second set of analyses to clarify the nature of this relationship, especially as it applies to rural areas. In this instance, the analyses were performed separately for rural and nonrural states. Plotting separate trends allowed us to examine whether the relationship proposed above surfaced in rural and nonrural states alike. The production of the trend lines for the graphical analysis required a "relative" trend line, as before. The ratio approach used previously was not an option in this instance, since each ratio reflected the relative performance of both the rural and nonrural states. Measures of the relative performance on the variables for the rural states, independent of the nonrural states, and vice versa, were required. To create these measures, the raw data on the three variables of interest were converted to T-scores, and the standardized means (weighted by population) across the 11 rural states were plotted for each census year. The same procedure was repeated for the 12 nonrural states. This provided a picture of how the mean for the study states (rural or nonrural) compared to the mean for all states over the period from 1940 to 1980.

Figure 4 shows the trends in the T-scores for rural states only. These plots were produced with the education variables lagged, since evidence from the previous analyses strongly suggested that changes in economic development led to changes in education. Unlike Figure 3, however, Figure 4 shows no clear pattern. The mean percentage of adults graduating from high school in rural states remains almost constant, at about half a standard deviation below the national average. Similarly, except for an increase between the first and second data points, the college variable remained relatively stable relative to the U.S. as a whole. An examination of the trend for income, however, reveals that from 1940 to 1970, rural states steadily lost ground in per capita income compared to other states. In short, this plot offers no real evidence that relative changes in per capita income are followed by corresponding changes in the education variables 10 years later. The overall relationship suggested in Figure 3 appears not to hold for rural states.

In Figure 5, T-scores for the nonrural states are plotted, again with the education variables lagged. This time, a clearer pattern emerges. From 1940 to 1950, all three trend lines drop with approximately equal slopes. This indicates that a drop in the economic standing of the nonrural states from 1940 to 1950, relative to the nation as a whole, was followed by almost equal drops in relative educational standing during the next 10-year period. Between 1950 and

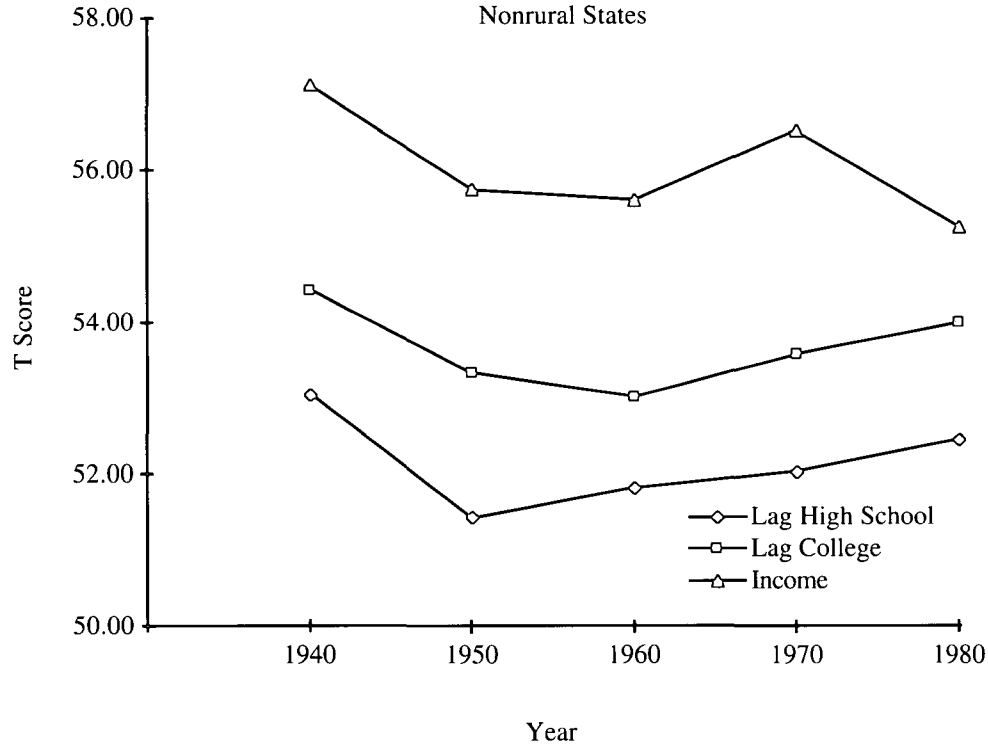

Figure 5. Income and lagged education trends for nonrural states.

1960, the lines for income and lagged college graduation rate are almost parallel. For the remainder of the time period, the three trend lines are nearly parallel, except that income drops sharply during the last 10-year period. The relationship between income and education seems more well-defined for nonrural than for rural states, with economic changes leading to educational changes.

In order to gain a better understanding of this last result, we considered the possibility that the state of the existing economy represented the real driving force behind the relationship between educational attainment and income level. Over the past 60 years, the economies of rural areas have not progressed as rapidly as those in nonrural areas. Therefore, as rural economies stagnated, regressed, or grew more slowly, an overall net migration of younger and more educated adults from these areas ensued (Broomhall & Johnson, 1994). Thus, expanding economic bases attracted more educated people, thereby establishing a clear relationship between income and educational attainment for one set of states but clouding it for the other. This may, in part, help explain the nearly parallel trend observed in Figure 5 between the lagged college variable and income. We conducted an additional analysis, based on the above assumptions regarding the dynamics underlying the relationship between education and income. We hypothesized that the relationship between the variables would be clearest if we compared sets of states categorized differently. One set would comprise those states whose economies were performing very well, as defined by personal income. The other set would be the states in which the economies were performing substantially less well. We constructed these two sets by identifying states that were in the lowest 33% with regard to per capita income in 1940 and those in the highest 33% for the same year. The mean score on each of the three variables was computed for each census year for these two groups of states. A ratio was created for each census year by dividing the average obtained for the low-income states by the average for the high-income states. These ratios reflected the relative distance between the low and high-income states on the three variables. Changes in the actual magnitude of one variable for the low-income states would be reflected in the ratio as a function of whether it (the change in the variable) closed the gap with the high income states.

These ratios were plotted with the education variables lagged. This was done based on the results obtained from previously described analyses in which only the lagged educational variables produced a consistent pattern. This plot is presented in Figure 6. The lagged college ratio was omitted from the presented plot because the first two segments of its trend line almost overlay the first two segments of the lagged high school ratio trend line. This

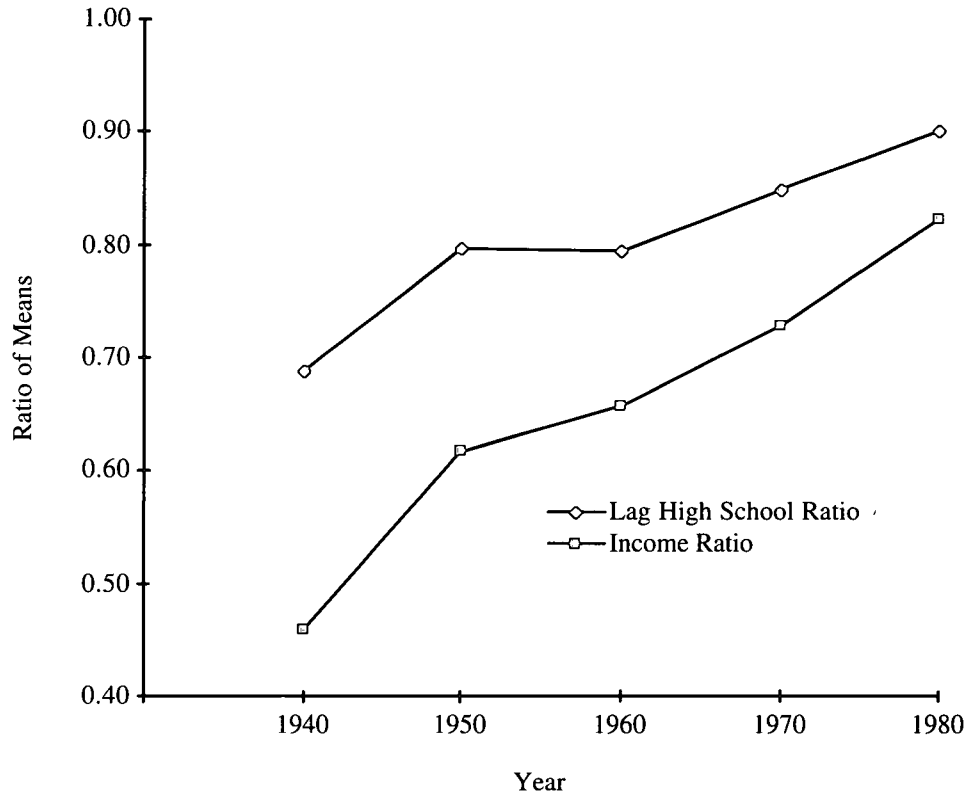

Figure 6. Trends in the ratio of mean income and lagged high school ratio for low/high income states.

visually complicated the pattern evidenced with the lagged high school ratio. Omitting this trend from the presented plot does not hide any relationship between the lagged college variable and income. The last two segments of the lagged college ratio trend had a negative slope while the last two segments of the income trend line have a positive slope as observed in the figure. It must be noted, however, that the college variable is much more stable than the other two, ranging only from .74 to .80, whereas the high school graduation ratio ranges from .68 to .90.

The trend between per capita income and the lagged percentage of high school graduates is nearly perfect with the two trend lines being almost parallel. From this analysis, it appears that there is a very strong relationship between the per capita income in a state and the percentage of that state's population that has graduated from high school 10 years later; changes in the income level very closely parallel changes in the subsequent education level. This may suggest that the economic conditions that produce higher levels of income in some way also lead higher percentages of the population to complete high school. The fact that income appears to be less related to the college variable may be because the proportion of college graduates in the population is much smaller, and their net influence on per capita income would be smaller. The important point is not the lesser relationship involving the college graduate variable, however, but the direction of the relationship between education and income. Among these states, advances in the relative amount of education seem to follow relative advances in income.

Conclusions

Our results lead to several conclusions. First, a relationship does exist between education level and income level, but it seems more likely that relative advances in income levels are followed by relative advances in education level, rather than the reverse. Second, this relationship is weaker for rural states than for nonrural states. Third, it may be that increases in economic level, as evidenced in personal income, do not cause advances in educational achievement, despite the findings reported above. Our results, however, are inconsistent with the view maintained in education policy, which asserts that educational improvement leads economic improvement.

We began our study by indicating that we would investigate the relationship between educational attainment (achievement) and economic progress. In addition to producing a description of the relationship, we undertook this analysis to address the larger policy issue of whether pro-

moting a state or nation's economic progress constitutes a reasonable aim for education. The evidence we report suggests it is not, at least at the state level. One might further speculate that the rationale does not pertain at the national level. It seems more likely that, within the national frame, some states and some regions are economic and educational winners and some are losers. National and state rhetoric (policies) obscure these differences.

What does this mean for rural education? Rural educators and citizens should treat as doubtful claims that educational improvement will lead to improvement in rural economies. Policymakers may make these claims in response to the difficulty of fashioning economic solutions to rural economic troubles. We need to recognize the false assumption, according to our results, on which such claims are made and the false hopes that they create. The development of the individual and the individual as a member within a larger rural community represent better and more attainable goals for a student's educational achievement and experience.

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