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ABSTRACT

Long-term underinvestment in education in central Appalachia has resulted in a work force that is not highly adaptable to employment in other areas besides coal-based industries. Employers who require skilled workers and who pay higher wages are discouraged from locating in the area by a less educated work force. This study identifies factors that influence high school students' decisions to obtain additional education. It also examines the system of incentives in Appalachia that might discourage students from performing well scholastically. Data were collected through group interviews with 744 high school seniors and 560 parents in 12 high schools in 4 rural school districts in Appalachia. The survey was also administered to high school dropouts of the same cohort and their parents. Participants expressed their attitudes about education, willingness to move away to get preferred jobs, and perceptions of local job opportunities. Multiple regression analysis found that students willing to move and perceiving local job opportunities to be scarce performed better at school. Also, students who placed a higher value on education performed better academically. (LP)

# EDUCATION AND ECONOMIC DEVELOPMENT IN RURAL APPALACHIA

Thomas G. Johnson and David E. Broomhall

# Education and Economic Development In Rural Appalachia

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## The Changing Economic Environment in Rural Communities

Major changes have occurred in the economic structure of rural America. No longer are rural economies dependent primarily on agriculture, forestry, or mining. Declining employment in these sectors has led to the need for diversification into manufacturing and service industries. Some rural communities have adapted quite well to these economic challenges and have prospered. But many have not. Particularly hard hit has been the coal region of central Appalachia. Various factors have contributed to an overall decline in economic prosperity, and have caused this region to fall further behind the nation as a whole in virtually all measures of economic well-being.

One reason for the lack of economic growth in the Central Appalachian region is the nature of its work force. The coal-based economy has historically provided disincentives for young people to invest in education because the returns to this investment have been low or negative (Bluestone, Murphy, and Stevenson, 1973). Long term under-investment in education has resulted in a work force that is not highly adaptable to employment in other industries. Employers who require skilled workers and who pay higher wages are discouraged from locating in the area by the less educated labor force. Only those firms that require low skilled labor and that are attracted by low wage rates are likely to consider locating in the region. Establishment of these kinds of low-skill, low-wage jobs contributes little to local economic prosperity and may lead to further declines in the local quality of life.

## Educational Investment in Underdeveloped Communities

The purpose of this study was to gain a better understanding of the process by which individuals make decisions regarding education. More specifically, the research examines the system of incentives in the coal counties which might discourage students from performing well scholastically. The primary hypothesis tested by this research was that local economic and social conditions and attitudes influence the accumulation of human capital by influencing people's perceptions of the value of education. The value of education in the context of this study refers to its contribution to future occupational opportunities and increased quality of life.

Human capital is a term used to describe investment in the productivity of labor. Human capital includes formal education and a variety of other aspects of productivity including on-the-job-training and improvements in health. Human capital decisions depend, in part, on the individual's attitudes and perceptions of the expected costs and returns to that investment. One's attitudes develop in reaction to influences from the family, from casual interaction with, or observation of others in the community, and from influences outside the local community. Of particular importance in the human capital investment decision of rural residents are attitudes toward one's community, the willingness to move away to obtain employment, attitudes toward employment in the community's traditional occupation (farming, mining, logging), and attitudes toward education and educated people.

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Since much of Appalachia is isolated--both geographically and economically--one's willingness to move may have an important influence on the value one places on education, as the acquisition of skills necessary to compete successfully in labor markets elsewhere is critical. Since formal education is the primary source for development of these skills, those who live in areas where economic opportunities are limited and who are more willing to move away will have a greater incentive to perform well in school. Those less willing to leave need only consider local returns to education, and therefore perceive that the potential returns to investments in education (good paying jobs which require an education) are either too low or too uncertain to justify the sacrifice required. At the same time the community's investment in the education of it's youth is not returned when they migrate to other communities to find jobs. This creates an incentive for the local community to provide a level of support for education below that which is socially optimal.

A student's decision to stay in school and to perform well in school are determined by their personal utility function and their perceived opportunities with and without an education, that is, the expected economic returns to education. The term "expected" is important here, since the incorporation of expectations introduces the likelihood that individuals will have different expectations about the same set of future alternatives. These expectations will depend on the amount and quality of information available, and upon the process by which individuals form their expectations about the future. The process by which individuals form expectations or perceptions of the returns to education is important in the decision process. Perceptions are developed from information received from a variety of sources including one's family, others in the community, community institutions, schools, and the media. These factors are part of a process by which an individual develops a set of attitudes which permits an ordering of all possible future outcomes. The individual's perceptions of future wages and occupations and observations of economic and social realities dictate an optimal strategy upon which the individual will act with reasonable confidence.

**The Data**

This research was designed to achieve two primary objectives. The first objective was to document the attitudes that high school aged youths and their parents have regarding education and occupational choice. The second objective was to determine the manner in which factors in the local community influence the valuation of education, academic performance, plans to acquire additional education or training, and occupational choice.

To address these objectives, a survey was conducted in four rural school districts in Appalachia. The four school districts chosen for this study were: Montgomery County, Kentucky; Montgomery County, Virginia; Wise County, Virginia; and the City of Norton, Virginia. The primary criteria for choosing these school districts was that they represent rural Appalachian communities with significantly different industrial bases and local economic opportunities. Table 1 shows the employment base in the four schools districts by major industrial sector. Montgomery County, Kentucky had a population of 19,561 in 1990. Its economy is dominated by several medium to large manufacturers. Two of the larger employers are garment factories which together employ approximately 570 people. Three large manufacturing plants, together employing over 1,400 people, produce electrical machinery and household appliances. Several smaller manufacturers produce a variety of goods such as wire fasteners, motors, plastic drums, and other mechanical equipment.

Wise County and the City of Norton, Virginia are located in the coal fields of Southwestern Virginia. They had 1990 populations of 39,537 and 4,247 respectively. The major industry in the area is coal mining, which provides over 4,000 jobs directly and many more indirectly in such industries as heavy equipment building, explosives, and mine services. Montgomery County, Virginia had a

Table 1. Employment in Major Industrial Sectors by School District.[a]

| Industry | Montgomery Kentucky | Wise Virginia | Norton Virginia | Montgomery Virginia |
|---|---|---|---|---|
| Mining | 1.3% | 35.5% | 15.4% | b |
| Construction | 6.9% | 2.6% | 3.6% | 5.0% |
| Manufacturing | 28.9% | 4.5% | 7.6% | 38.5% |
| Transportation & Public Utilities | 2.1% | 3.8% | 6.9% | 1.2% |
| Wholesale Trade | 10.8% | 5.5% | 11.9% | 2.0% |
| Retail Trade | 25.4% | 23.9% | 22.8% | 29.5% |
| Finance, Insurance, and Real Estate | 5.1% | 4.2% | 4.1% | 4.6% |
| Services | 17.5% | 19.3% | 27.7% | 17.6% |
| Other | 2.0% | 0.7% | 0.0% | 1.6% |

[a] Excludes government employees and railroad employees, and self employed persons. Since the data do not include government workers, the impact of the services sector is understated, particularly in Montgomery, Virginia, where 30 percent of the employment is in government. This compares to proportions of 20 percent and 16 percent for Wise and Norton, respectively.

[b] Less than one percent.

Source: U.S. Dept. of Commerce, Bureau of the Census. *County Business Patterns*, 1988, vols. 17, 48.

population of 73,913 in 1990. Its economy is diversified in manufacturing and services. Virginia Tech is the County's largest employer. A number of large to medium size manufacturing firms produce propellants and explosives, automotive parts, apparel, furniture, and electronic components. There are also a large number of small high tech manufacturing and service firms. Table 1 is less reflective of employment patterns in Montgomery, Virginia, because it does not include government employees

The analysis was based on surveys of high school seniors and their parents in each of 12 high schools in the four school districts. The research focused on a variety of factors hypothesized to influence the valuation of education and academic performance. Of particular importance were the attitudes and behavior of dropouts in comparison to those of graduating students, as dropouts comprise a large proportion of the adult population in many counties in Appalachia. Therefore, the survey was also administered to high school dropouts who would have graduated with the high school seniors had they not dropped out. One parent of each dropout was interviewed as well. The students were interviewed in large groups at each of the high schools while the dropouts and all of the parents were interviewed by telephone. The survey data were augmented by school records of performance on standardized achievement tests, and grade point averages. Table 2 shows some pertinent statistics related to the survey.

## The Statistical Analysis

The youths were asked to respond to a variety of statements to determine the value placed on education, the willingness to move away to get the type of job they prefer, and the perceptions of local job opportunities. Table 3 shows definitions of the variables associated with these statements. Responses were noted as to whether they strongly agreed, somewhat agreed, neither agreed nor disagreed, somewhat disagreed, or strongly agreed with the statement.

Table 4 shows descriptive statistics of the variables associated with the valuation of education by school district. The first two variables indicate a willingness to support education through increased taxes and by setting certain standards of performance. Interestingly, the dropouts showed a statistically higher propensity to support the concept of performance standards than did the students. The two variables showing the perceived value of a high school diploma and college degree require some clarification. The youths were asked to respond to three statements regarding the types of jobs one is prepared for without a high school diploma, with a diploma, and with a college degree. The value of a high school diploma was defined as the difference between the type of job one is prepared for with and without a high school diploma, and the value of a college degree as the difference between having a diploma and having a college degree.

The means of diploma value in Montgomery, Virginia and Montgomery, Kentucky are both lower than Wise and Norton, but likely for different reasons. Employment opportunities in Montgomery, Kentucky are primarily unskilled or low skilled production and manufacturing jobs, jobs for which a high school diploma may provide only small marginal returns. In Montgomery, Virginia there is a wider range of employment opportunities, and many youths may have set their sights on some of the higher skilled, higher paying jobs which require more education than a high school diploma provides, and therefore place a low value on a high school diploma.

Table 5 shows that the youths in Montgomery, Virginia have a much more positive perception of employment opportunities for both high schoo and college graduates than the other three school districts. This probably reflects an accurate perception, given the more vibrant and more diverse economy in Montgomery Virginia. Simple correlations for the entire population between 3_HOURS_AWAY and both DIPLOMA_JOBS and DEGREE_JOBS, and OUT_OF_SOUTH and DEGREE_JOBS were found to be

Table 2. Response Rates of Students and Their Parents by School.

| School | Enrollment | Students Surveyed | Percent | Parents Surveyed | Percent |
|---|---|---|---|---|---|
| Montgomery Co. KY | | | | | |
| Mt. Sterling HS | 269 | 184 | 68% | 159 | 86% |
| Wise Co. VA | | | | | |
| Appalachia HS | 71 | 56 | 79% | 43 | 77% |
| Coeburn HS | 123 | 57 | 46% | 43 | 75% |
| J.J. Kelley HS | 144 | 104 | 72% | 75 | 72% |
| Pound HS | 62 | 23 | 37% | 17 | 74% |
| Powell Valley HS | 168 | 60 | 36% | 50 | 83% |
| St. Paul HS | 40 | 23 | 58% | 20 | 87% |
| County Total | 608 | 323 | 53% | 248 | 77% |
| Norton VA | | | | | |
| J.I. Burton HS | 60 | 38 | 63% | 31 | 82% |
| Montgomery Co. VA | | | | | |
| Auburn HS | 73 | 18 | 25% | 16 | 89% |
| Blacksburg HS | 270 | 114 | 42% | 71 | 62% |
| Christiansburg HS | 195 | 60 | 31% | 29 | 48% |
| Shawsville HS | 45 | 7 | 16% | 6 | 86% |
| County Total | 583 | 199 | 34% | 122 | 61% |
| Total | 1520 | 744 | 49% | 560 | 75% |

Table 3. Description of Variables Used in the Statistical Analysis.

| Variable Name | Description |
|---|---|
| LIVE_NEAR | Belief that children should try to live near their parents after completion of education. |
| 3_HOURS_AWAY | Youth's willingness to move to a large city three hours away from home to get a job. |
| OUT_OF_SOUTH | Youth's willingness to move to a large city outside the South to get a job. |
| DIPLOMA_JOBS | Youth's perception of local employment opportunities for jobs which generally require a high school diploma. |
| DEGREE_JOBS | Youth's perception of local employment opportunities for jobs which generally require a college degree. |
| BASIC_TEST | Support for requiring students to pass a basic skills test to graduate from high school. |
| TAXES | Preference for increasing expenditures for education. |
| DIPLOMA_VALUE | Perception of the value of a high school diploma in accessing higher quality employment opportunities. |
| DEGREE_VALUE | Perception of the value of a college degree in accessing higher quality employment opportunities. |
| SCHOOL_IMPORTANCE | Youth's perception of the importance of education. |

Table 4. Summary Statistics of Youth's Valuation of Education by School District.

| Variable | School District | N | Mean | Standard Deviation | Minimum Value | Maximum Value |
|---|---|---|---|---|---|---|
| BASIC_TEST | | | | | | |
| | MONT_KY | 193 | 3.461 | 1.399 | 1.000 | 5.000 |
| | WISE_VA | 349 | 3.842 | 1.192 | 1.000 | 5.000 |
| | MONT_VA | 238 | 3.899 | 1.225 | 1.000 | 5.000 |
| | NORTON_VA | 43 | 3.814 | 1.385 | 1.000 | 5.000 |
| | Total | 823 | 3.768 | 1.272 | 1.000 | 5.000 |
| TAXES | | | | | | |
| | MONT_KY | 193 | 3.440 | 1.220 | 1.000 | 5.000 |
| | WISE_VA | 347 | 3.473 | 1.166 | 1.000 | 5.000 |
| | MONT_VA | 237 | 3.586 | 1.178 | 1.000 | 5.000 |
| | NORTON_VA | 43 | 3.581 | 1.349 | 1.000 | 5.000 |
| | Total | 820 | 3.504 | 1.192 | 1.000 | 5.000 |
| SCHOOL_IMPORTANCE | | | | | | |
| | MONT_KY | 57 | 4.351 | 1.044 | 1.000 | 5.000 |
| | WISE_VA | 348 | 4.374 | 0.799 | 2.000 | 5.000 |
| | MONT_VA | 238 | 4.282 | 0.900 | 1.000 | 5.000 |
| | NORTON_VA | 43 | 4.233 | 0.972 | 1.000 | 5.000 |
| | Total | 686 | 4.331 | 0.868 | 1.000 | 5.000 |
| DIPLOMA_VALUE | | | | | | |
| | MONT_KY | 192 | 1.411 | 1.025 | -2.000 | 4.000 |
| | WISE_VA | 347 | 1.643 | 1.053 | -1.000 | 4.000 |
| | MONT_VA | 238 | 1.412 | 1.136 | -2.000 | 4.000 |
| | NORTON_VA | 43 | 1.442 | 0.983 | 0.0 | 4.000 |
| | Total | 820 | 1.511 | 1.072 | -2.000 | 4.000 |
| DEGREE_VALUE | | | | | | |
| | MONT_KY | 193 | 0.969 | 0.841 | -2.000 | 3.000 |
| | WISE_VA | 347 | 1.156 | 0.886 | -2.000 | 3.000 |
| | MONT_VA | 238 | 1.017 | 0.981 | -4.000 | 4.000 |
| | NORTON_VA | 42 | 1.238 | 0.821 | 0.0 | 3.000 |
| | Total | 820 | 1.076 | 0.904 | -4.000 | 4.000 |

Table 5. Summary Statistics of Perceived Employment Opportunities and the Willingness to Move by School District.

| Variable | School District | N | Mean | Standard Deviation | Minimum Value | Maximum Value |
|---|---|---|---|---|---|---|
| DIPLOMA_JOBS | | | | | | |
| | MONT_KY | 191 | 1.592 | 1.037 | 1.000 | 5.000 |
| | WISE_VA | 347 | 1.816 | 1.037 | 1.000 | 5.000 |
| | MONT_VA | 237 | 2.354 | 1.070 | 1.000 | 5.000 |
| | NORTON_VA | 43 | 1.628 | 0.874 | 1.000 | 4.000 |
| | Total | 818 | 1.910 | 1.079 | 1.000 | 5.000 |
| DEGREE_JOBS | | | | | | |
| | MONT_KY | 192 | 1.859 | 1.081 | 1.000 | 5.000 |
| | WISE_VA | 346 | 2.243 | 1.108 | 1.000 | 5.000 |
| | MONT_VA | 238 | 2.739 | 1.140 | 1.000 | 5.000 |
| | NORTON_VA | 43 | 2.000 | 1.000 | 1.000 | 4.000 |
| | Total | 819 | 2.284 | 1.152 | 1.000 | 5.000 |
| 3_HOURS_AWAY | | | | | | |
| | MONT_KY | 193 | 3.715 | 1.180 | 1.000 | 5.000 |
| | WISE_VA | 348 | 3.980 | 1.122 | 1.000 | 5.000 |
| | MONT_VA | 238 | 3.471 | 1.268 | 1.000 | 5.000 |
| | NORTON_VA | 43 | 4.186 | 1.118 | 1.000 | 5.000 |
| | Total | 822 | 3.781 | 1.200 | 1.000 | 5.000 |
| OUT_OF_SOUTH | | | | | | |
| | MONT_KY | 193 | 3.047 | 1.251 | 1.000 | 5.000 |
| | WISE_VA | 346 | 3.540 | 1.290 | 1.000 | 5.000 |
| | MONT_VA | 238 | 3.063 | 1.372 | 1.000 | 5.000 |
| | NORTON_VA | 43 | 3.535 | 1.386 | 1.000 | 5.000 |
| | Total | 820 | 3.285 | 1.330 | 1.000 | 5.000 |

statistically significant and negative. This suggests that a negative relationship exists between a youth's willingness to move and the perception of local job opportunities. Further, the willingness to move variables are significantly higher in Norton and Wise than in the two Montgomery's, which may be a response to the relatively lower perception of local job opportunities as shown by DIPLOMA_JOBS and DEGREE_JOBS. However, youths in Montgomery, Kentucky had similarly negative perceptions of local job opportunities but did not show the same high willingness to move.

### Hypotheses Tests

Multiple regression analysis was used to evaluate those factors hypothesized to influence the value that individuals place on education and academic performance. Also of importance was the educational and occupational aspirations of the youths. Since the dependent variables were dichotomous in the analysis of educational and occupational aspirations, logit analysis was used to evaluate those factors hypothesized to influence aspirations. Six hypotheses were evaluated by this research. In general the statistical results are not particularly strong but do, in general, support the hypotheses[1] These hypotheses and the resultant conclusions follow.

1. *Those youths whose parents place a higher value on education will place a higher value on education.*

There was only weak support for the hypothesis that this relationship exists.

2. *Those youths who are more willing to move to obtain employment will place a higher value on education.*

There was mild support for this hypothesis. Once other factors are accounted for, the students do not associate the value of education and their willingness to move within the region. However, there is evidence that at least some students willing to move out of the region place a higher value on education.

3. *Perceptions of local employment opportunities influence the value that youths place on education.*

A negative relationship exists between the perception of local job opportunities for jobs which generally require a high school diploma and the value youths place on education. The general hypothesis presented earlier was that the perception of local employment opportunities, together with the willingness to move influence the value one places on education. Significance among these three variables exists in a simple three-way correlation, supporting the hypothesis that those who are more willing to move, and who perceive that local job opportunities are scarce, perform better in school. The regression equations do not show a similar relationship for local jobs which require a college degree.

4. *Those youths who place a higher value on education will exhibit higher academic achievement.*

This hypothesis was supported by the analysis. Those students that supported setting minimum standards to graduate from high school, who believed that school was generally important, and who placed a higher value on a college degree, performed better in school. The value placed on a high school diploma and the willingness to pay for education through increased taxes did not have a statistically significant influence on the value placed on education.

5 and 6. *Those youths who place a higher value on education will have higher educational and occupational aspirations.*

These hypotheses were also supported by the analysis. Youths who place a higher value on education plan to stay in school longer and expect to get better jobs than those who do not. In addition, willingness to move was positively related to the educational and occupational aspirations.

## Conclusions and Implications for Rural Policy

Previous research has found that family socioeconomic background is an important factor in explaining educational performance. This suggests that to improve educational performance and perhaps break the cycle of poverty, it may be necessary to improve socioeconomic conditions in the home. However, this study has shown that the perception of the value of education influences performance as well, and that these perceptions are often related to non-familial variables. Therefore, it may be advisable to focus attention on these non-familial factors in an attempt to improve academic performance. It may be more effective, and certainly less costly, to influence performance in this manner than to change socioeconomic conditions in the home.

Much of the research examining the relationship between socioeconomic factors and achievement using disaggregated data was conducted in the 1960s and early 1970s. The findings of those studies consistently showed that socioeconomic factors have a strong influence on academic performance. Those studies which used some measure of attitudes found that they were highly correlated with socioeconomic characteristics. Since that time there have been major changes in the availability and source of information capable of influencing attitudes and behavior. The widespread availability of television in even the most remote areas and the rising amount of time the average American spends watching television undoubtedly has an influence on attitudes. This, and possibly other factors have increased the importance of external influences on attitudes and perceptions about education.

This research also highlights differences in the characteristics of students based on post-high school plans. Cognizance of these differences may help school administrators provide programs appropriate to the needs of the entire student body, including those students who are at risk of dropping out. These results may also be used to show rural communities that the availability and quality of local employment opportunities have important implications for the performance of the students in the community.

These findings also suggest that a variety of local factors influence academic performance, which in turn impact the future productivity of the local labor force. The findings support the hypothesis that those students with the greatest ability, and who are the potential local leaders of the future, have a strong incentive to look elsewhere for employment if good jobs are not available locally. This tends to erode the potential future productivity of the local work force, which discourages high quality employers from moving into, or remaining in, these communities. Perhaps development efforts should pay increased attention to improving the local quality of life through improved public services. Such efforts could reduce the outflow of the more productive workers and best students, perhaps lure previous migrants back to the area, and improve the attractiveness of the community to potential new employers.

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[1]For a thorough discussion of the statistical analysis, see Bromhall and Johnson.