The Influence of the Local Economy and the Willingness to Move on Human Capital Accumulation in Central Appalachia

David Broomhall*

Abstract

This study uses logit analysis to examine the influence of the perception of local economic opportunities and the willingness to move on the educational aspirations of rural high-school-aged youths. Those youths who are more willing to move have a greater career opportunity set and a strong incentive to achieve in school, since education allows them to compete for jobs elsewhere. A low willingness to move, coupled with a low perception of local job opportunities, translates into a low expected return to education, which reduces the incentive to achieve in school.

Key Words: economic opportunity, educational aspirations, human capital, logit analysis, mobility, rural development

Introduction

An increasingly important area of research in rural economic development studies the link between human capital accumulation and economic development. Economists argue that a weak rural economy provides little incentive for those who prefer to remain in the community to obtain advanced skills to become more productive, since the economic return to that investment of time and effort is generally not available locally. Likewise, without a productive workforce it is difficult to attract employers who require such skills and would pay higher wages. This situation is characteristic of much of Appalachia, where economic opportunity and education levels are among the lowest in the nation.

Research by Broomhall and Johnson (1994) has shown that the value that youths place on education is influenced by both local employment opportunities and the willingness of an individual to relocate to obtain employment. The purpose of this research is to extend their findings to determine if these same factors influence the youths' plans for acquiring additional human capital in the form of formal education or training. The paper begins with a discussion of the relationship between human capital accumulation and economic development in rural areas, with particular attention given to rural Appalachia. A conceptual model of human capital accumulation in rural areas is presented, followed by a presentation of the statistical model and a discussion of the data. A presentation and discussion of the empirical results follow. The paper closes with a summary and some concluding comments.

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*David Broomhall is an economic development specialist in the Agricultural Department at Purdue University, West Lafayette, Indiana. The author would like to thank Thomas G. Johnson, Laura Hoelscher and three anonymous referees for their comments on earlier drafts.

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Economic Development and Human Capital Accumulation in Rural Areas

Throughout most of this century, America's rural areas have generally lost population while the urban areas have grown and prospered. This transformation was facilitated by, among other things, technological change, which reduced the need for agricultural labor. Throughout the 1950s, manufacturing offered reasonable wages and steady employment. In more recent decades, service industry employment has grown relative to both manufacturing and agriculture, and has provided employment for an increasing share of rural workers (Miller and Bluestone, 1987). Migration from rural areas has had a profound impact on the rural economy because those most likely to leave rural communities are often the most productive (Caudill, 1963; Swanson and Butler, 1987). Those who remain represent a less productive labor force, suited primarily to low-skill, low-wage employment.

Appalachia is an area of the country that has seen more than its share of economic problems. The economy of much of central Appalachia is based on coal mining, and this has had a profound influence on economic development. Kraybill, Johnson, and Deaton (1987) compared quality-of-life measures in the coal-producing region of Virginia with conditions elsewhere in Virginia. A variety of measures were examined, including income, employment, education, health care, and housing. By virtually all measures, the quality of life in the coal region was found to be lower than elsewhere in the state. They argue that variability in the demand for coal has caused fluctuations in the demand for mining labor. This, coupled with technological change and various cultural, political, and geographic factors, has created an environment where it is difficult for many to provide a standard of living for themselves and their families comparable to the rest of the nation. In a similar study, Duncan and Tickamyer (1983), using Kentucky data, found that various quality-of-life measures were significantly higher in counties classified as manufacturing-dependent than those classified as coal-dependent.

Educational levels in Appalachia are also low. DeYoung (1985) found that in the four central Appalachian states–Kentucky, Tennessee, Virginia, and West Virginia–educational performance in Appalachian schools was below that in non-Appalachian schools by all measures. DeYoung also examined differences in the inputs and outputs of education based on whether the economy of the school district was based on manufacturing, mining, or agriculture. Using Kentucky data, DeYoung found that areas that relied more heavily on income from mining had lower performance levels on basic skills tests, lower expenditures on education, and teachers with less training. In addition, students from manufacturing counties performed better on standardized achievement tests than did students from non-manufacturing counties. Kraybill, Johnson, and Deaton found that eighth grade math, reading, and language arts scores were significantly lower in the coal region than the rest of Virginia, and that a smaller percentage of high school graduates go to college. They also found that high school dropout rates were significantly higher in the Virginia coal region. A better understanding of the factors that encourage, or discourage, an individual from acquiring human capital may be the key to understanding these regional differences.

Conceptual Model

Human capital theory is based on the premise that individuals will maximize the present value of lifetime earnings by pursuing additional education or training up to the point at which the value of the additional returns to that training is equal to the cost of obtaining it. Schultz (1961) defines human capital as expenditures that improve individual productivity. This study looks at just one aspect of human capital, namely, formal education or training.

Three broad sets of factors influence educational outcomes: family influences, influences from the community, and individual characteristics. Data for the "real" outcomes of education–one's occupation, lifetime earnings, or some subjective measure of the contribution of education to the enjoyment of life–are difficult to acquire. Academic performance and plans for additional education are not really outcomes, but are often used as measures of outcomes because the data are more readily available. This study focuses on plans for additional education as an outcome of the education process.

Family influences have been found to influence educational outcomes. Coleman (1966)

found that socioeconomic factors such as income, and the parents' occupation and education explain differences in educational outcomes. Charters (1963) summarized the literature on the influence of socioeconomic factors, concluding that:

> "...it has been so consistently confirmed by research that it can now be regarded as an empirical law. ...Social class position predicts grades, achievement and intelligence test scores, retention at grade level, course failures, truancy, suspensions from school, high school drop-outs, plans for college attendance and total amount of formal schooling" (p. 739-40).

Community factors refer to influences such as institutions, particularly schools, the social character of the community, and the influence of the local economy. The influence of schools on various educational outcomes has been the subject of numerous studies. Hanushek (1989) provides a comprehensive review of 187 studies examining the relationship between educational inputs (such as expenditures per pupil, student-teacher ratio, and teacher experience) and educational outcomes. His primary finding was that "there is no strong or systematic relationship between school expenditures and student performance" (p. 48). However, Hanushek argues that measurement problems prevent the establishment of a systematic relationship between school inputs and outputs, stating that "the conclusion that schools and teachers are important is very firm."

Smith (1989) asserts that individuals, in their social or daily contact with others in the community, observe that more educated individuals have access to a wider array of goods and services due to their generally higher incomes, which improves the quality of life. He argues that the relationship between quality of life and education is demonstrated through casual interaction and observation, and that it may motivate others to acquire education.

The economic character of the community may also influence educational outcomes, particularly if the individual plans to spend a productive life in the community. Bluestone, Murphy, and Stevenson (1973) found that industries predominantly located in rural areas—agriculture, fishing, forestry, and mining—are the industries that provide the smallest return to acquiring formal education. Mining is especially low. The average wage for white males with a high school diploma employed in mining is only 5.8 percent higher than for those with nine to 11 years of school completed, compared to an all-industries average difference of 8.8 percent. The implication is that there is little incentive in areas dependent on traditionally rural industries to complete high school. With regard to the incentives in mining-dependent areas, Kraybill, Johnson, and Deaton conclude that:

> "Low expectations (due either to uncertain income or to low average income) about income can lead to reduced incentives to invest in good health and education or to make long-range plans and decisions. As a result, long-term increases in quality of life are compromised and the total productivity of the community is reduced" (p. 66).

Individual characteristics refer to physical characteristics, mental ability, attitudes, and personal tastes and preferences. Physical differences, such as size and gender, may, in part, determine the type of occupation that an individual may consider suitable. Mental ability influences academic performance and may influence the expected rate-of-return to education.

Attitudes play an important part in the education process. Broomhall and Johnson found that attitudes about education had a positive influence on scores on standardized achievement tests and grade point average. Coleman argues that "attitudinal variables account for more of the variation in achievement than any other set of variables (all family background variables together, or all school variables together)" (p. 319).

Attitudes reflect personal tastes and preferences. Locational preferences may be of particular importance in some rural areas, especially those with limited economic and employment opportunities. Strong preference for remaining in

such a community may reduce the expected returns to education and provide a disincentive to invest in education. Alternatively, for those who are indifferent to location, or for those who would prefer to leave, the local economy may provide a positive incentive to invest in education, since education may provide one with the skills necessary to compete for jobs elsewhere.

The conceptual model of the community, family, and individual factors that influence educational outcomes is shown in figure 1. This model provides the framework for examining two primary hypotheses regarding education in rural areas: 1) local employment opportunities influence behavior with regard to the acquisition of education; and 2) the willingness to move influences behavior with regard to education. The interaction of these two factors is of critical importance. For those who are less willing to move, the expected rate-of-return to education is dictated by local economic conditions. For them, a dearth of local job opportunities reduces the expected rate-of-return to education, which reduces the incentive to acquire additional education or training. The expected rate-of-return for those willing to relocate may be much greater, as expectations are based upon a broader perspective. These two hypotheses are examined in the statistical model discussed in the following section.

Statistical Model and Data

These two hypotheses are examined using data from individuals in three school districts in Virginia and one in Kentucky. The school districts were chosen to reflect varying economic and employment characteristics within the central Appalachian region. Montgomery County, Kentucky, located approximately 50 miles east of Lexington, has a diversified economy based primarily on manufacturing and trade, with some agriculture. Wise County and the City of Norton, located in the coal fields of southwest Virginia, have an economy based primarily on coal extraction, with very little manufacturing and virtually no agriculture. The City of Norton, an independent governmental unit with its own school district, serves as a regional center for retail trade and professional services. Montgomery County, Virginia lies 30 miles west of Roanoke, and has an economy that features a diversified manufacturing and service base, with Virginia Polytechnic Institute and State University being the largest employer.

The data set is unique in that it includes attitudinal and family data from matching surveys of parent-child pairs. These data also include matching data from high school dropouts and their parents from the class of 1990. The dropout population is defined as the individuals who, with normal progress, would have graduated with the class of 1990 but who dropped out at some point prior to graduation. Written surveys of high school students were administered, and telephone interviews of the students' parents conducted, in the spring of 1990. The dropouts and their parents were interviewed by telephone in January, 1991. Usable surveys were obtained from 744 high school seniors, representing approximately 50 percent of the eligible student population in the study areas. Seventy-five percent (560) of the parents of students who provided usable surveys were interviewed. The response rate of the dropouts was 34 percent, which includes 75 matching pairs of dropout-parent surveys. The total number of usable matching surveys was 561.

One disadvantage of using individual-level data is that the community influences outlined in the conceptual model do not lend themselves to an analysis of individual decision-making, particularly the influence of the community. For example, local economic conditions are the same for all students in a school or district. However, it is not actual economic conditions, but the *perception* of economic conditions that influences behavior. Hence, the data set uses data on the perception of local economic conditions. The students were asked to respond to two statements on a one-to-five Likert scale (strongly agree; somewhat agree; neither agree nor disagree; somewhat disagree; and strongly disagree)[1] regarding local employment opportunities: "Good jobs for high school graduates are hard to find in [the community]" defined *DIPJ*; and "Good jobs for college graduates are hard to find in [the community]" defined *DEGJ*. Dummy variables were used to account for differences in institutions and social characteristics of the four communities (*MVA*, *NORT*, *WISE*, and *MKY*).

Four measures of socioeconomic background were used. Household income data

Figure 1. A conceptual model of educational outcomes

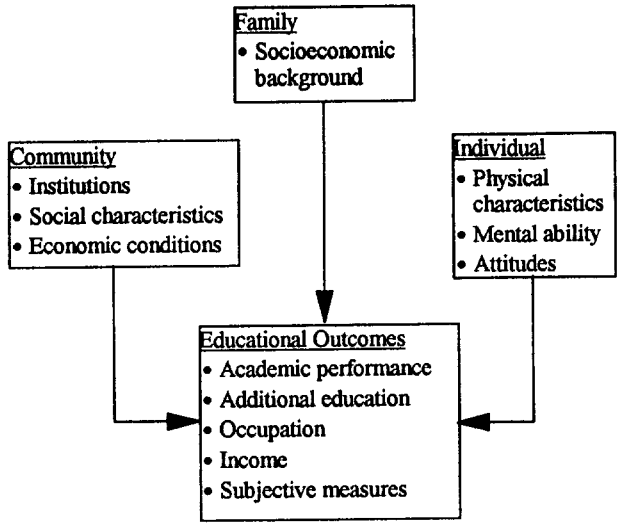

Table 1. Description of Employment Categories by Class

Class	Description
One	Production, farm, mining, transportation, and non-clerical service workers.
Two	Clerical and retail sales workers.
Three	Foremen and managers of production, farm, transportation, mining, clerical, and non-clerical service workers.
Four	Tradesmen and para-professional aides.
Five	Farm owner-operators, small business owners and managers.
Six	Technical, para-professional, non-clerical sales workers, managers of tradesmen, middle managers, contractors.
Seven	Professional, administrative, managers of technical and para-professional workers.

(HI_1,.. .,HI_3) were divided into three income groups (under \$20,000 per year; \$20,000 to \$40,000; and over \$40,000)[2]. *PEDUC* is the number of years of education of the parent with the greatest number of years of education, and *IPAR* is a dummy variable set equal to one for those children who live with only one parent. The occupation of the parents was divided into seven classes ($PJOB_1$, . . . , $PJOB_7$) based on the level of training or education generally required to perform the duties of the job[3]. The classification system used is shown in table 1. When both parents reported an occupation, the job class of the parent in the occupation of the highest rated class was used in the analysis.

With regard to individual physical characteristics, the only variables believed to have a clear and systematic influence on educational outcomes are race and gender. A race variable was not used because of the homogeneity of the sample population, which was almost entirely white Caucasian. A dummy variable (*FEM*) was used to account for gender differences.

Data on mental ability were not available. However, Charters claims that socioeconomic background explains scores on intelligence tests and plans for college attendance, while Bachman (1970) and Bachman et al. (1969) found a high correlation between socioeconomic background and various measures of mental ability. Because of these findings it was believed that the omission of data on mental ability would not bias the results and that the

influence of mental ability would be reflected in the socioeconomic background variables.

Attitudes are a reflection of the individual's utility function. As discussed earlier, one such attitude hypothesized to influence educational outcomes is the willingness of an individual to move away from home to obtain employment. The students and dropouts were asked to respond to the following three statements on a one-to-five Likert scale to assess their willingness to move away from home: "I would move to a large city 3 hours away from home to get a job" (*HOURS*); "I would move to a large city outside the South to get a job" (*SOUTH*)[4]: and "When the time comes for children to get a full-time job they should try to live near their parents" (*NEAR*).

This study focuses exclusively on plans for additional education or training as a measure of educational outcomes. Responses were provided regarding the student's post-high school plans. The choices offered were: get a job (*JOB*); become a homemaker[5]; join the armed forces (*ARMED*); go to a trade school (*TRADE*); attend a community college (*2YEAR*); attend a community college and then transfer to a four-year college or university (*TRANS*); and go to a four-year college or university (*4YEAR*). A seventh alternative outcome was defined by those who had dropped out of school (*DROP*). With the above variables incorporated the statistical model was defined as:

$$A = f(WISE, MVA, NORT, MKY, DEGJ, DIPJ, 1PAR, HI_1, HI_2, HI_3, PEDUC, PJOB, FEM, HOURS, NEAR, SOUTH) \quad (1)$$

where A = (*DROP, JOB, ARMED, TRADE, 2YEAR, TRANS, 4YEAR*)

Table 2 provides a description of each of the variables used in the models.

The dependent variable, A, is categorical, and as such was not amenable to estimation using OLS. A more appropriate method in this case is the binomial logit model. An alternative choice is the multinomial logit model. The difference between the binomial logit model and the multinomial logit model is that in the binomial model the choice is among one of the choices (for example, go to a trade school) and all other choices, and in the multinomial logit model the choice is between seven alternatives. The statistical program used (Limdep) was limited to 150 parameters, which is exceeded when all seven choices are used in the multinomial logit model. In addition, interpretation of the results is more difficult with the multinomial logit. For these reasons the binomial logit model was used in this analysis.

The logit model uses a maximum likelihood method that iteratively estimates values for the model parameters when the dependent variable is categorical data. Seven binomial logit models were used in the analysis, one model for each of the seven dependent variables. No measure of R-square exists for the logit model since it uses a maximum likelihood estimation procedure. However, as measured by the chi-square statistic, all of the models show a high degree of statistical significance. Series' of dummy variables were used to reflect the influence of those variables measured on a Likert scale, with the variable associated with strongly disagree being the omitted variable. The dummy variable associated with a specific response is identified by the subscript added to the variable name (for example, $SOUTH_2$ indicates that the individual somewhat disagrees that they would consider moving out of the south to get a job).

Results

The results of the models are shown in table 3. The interpretation of the dropout model differs slightly from the other models because it reflects a past decision, since dropouts have already dropped out. Hence the dropout model is not interpreted as a causal relationship, but is used to identify those influences that tend to represent the dropout population.

Dropout Model

The dropouts tend to have a more negative outlook on local jobs for high school graduates, as evidenced by the significance of $DIPJ_2$ and $DIPJ_4$ as compared to the omitted variable, $DIPJ_1$. This finding may be influenced by their own experiences

Table 2. Description of Variables Used in the Statistical Analysis

Variable	Description
Family	
IPAR	Dummy variable for student/dropout residing in a non-two parent family
PEDUC	Number of years of school completed by the parent with the greatest number of years of formal education
HI_1,...HI_3	Household income
JOB_1,...JOB_7[b]	Occupation of the parent with the highest rated occupation classified in seven occupation categories
Community	
DIPJ[c]	Perception of local employment opportunities for jobs which generally require a high school diploma
DEGJ[c]	Perception of local employment opportunities for jobs which generally require a high school diploma
MKY	Dummy variable for residing in Montgomery County, Kentucky
WISE	Dummy variable for residing in Wise County, Virginia
MVA	Dummy variable for residing in Montgomery County, Virginia
NORT[a]	Dummy variable for residing in Norton, Virginia
Individual	
FEM	Dummy variable for the student/dropout being female
NEAR[c]	Belief that children should try to live near their parents after completion of education
HOURS[c]	Willingness to move to a large city three hours away from home to get a job
SOUTH[c]	Willingness to move to a large city outside the South to get a job
Dependent Variables	
DROP	The student dropped out of school before completing high school
JOB	The student does not plan to acquire additional education or training
ARMED	The student plans to join the armed forces
TRADE	The student plans to attend a trade school
2YEAR	The student plans to attend a two-year college
TRANS	The student plans to attend a two-year college and then transfer to a four-year college or university
4YEAR	The student plans to attend a four-year college or university

[a]Variable was deleted in statistical analysis to prevent perfect collinearity.
[b]The omitted variable is for the parent not being employed.
[c]The lowest valued variable in the series was deleted in statistical analysis to prevent perfect collinearity.

because the dropouts are more likely to have had first-hand experience trying to secure full-time employment. The negative coefficient and significance of *PEDUC* indicate that the likelihood of dropping out is greater when the parents have fewer years of formal education. The significance of *MVA* in the dropout equation is more likely a reflection of the high response rate of the dropout population in that district than it is an indication that the likelihood of dropping out of school is greater if one resides in that county.

All of the *NEAR* variables in the dropout equation are positive and significant as compared to $NEAR_1$, the omitted variable. This means that the dropouts tend to be in strong agreement that children should live near their parents, which is an indication of a low willingness to move. The negative coefficient and significance of $SOUTH_4$ means that they are less willing to move to more distant locations. However, the positive sign and significance of $HOURS_4$ indicate a greater willingness to move to less distant locations.

Job Model

Individuals in the *JOB* category tend to have a more positive perception of the availability of jobs for college graduates, as evidenced by the significance of $DEGJ_3$ and $DEGJ_4$ as compared to the omitted variable. The negative coefficient on HI_3 indicates that those students who do not plan to pursue further education or training are less likely to come from higher income families. The negative coefficients and significance of three of the *HOURS* variables indicate that this group is less willing to

Table 3. Results of the Educational Aspirations Logit Equations

	DROP	JOB	ARMED	TRADE	2YEAR	TRANS	4YEAR
Community							
WISE	-0.1109	0.4910[a]	-0.1522	-2.2303[a]	1.3381[b]	1.6961[a]	-1.0263[a]
	(0.268)	(1.662)	(0.370)	(2.918)	(2.753)	(3.490)	(3.760)
MVA	1.9548[a]	-0.9396[b]	-0.6720	-1.6851[a]	0.1508	1.5718[a]	-1.4102[a]
	(4.323)	(2.491)	(1.180)	(1.942)	(0.253)	(2.971)	(3.939)
NORT	0.0962	0.1779	0.2750	-13.398	-11.072	-0.3440	-0.0262
	(0.130)	(0.334)	(0.398)	(0.050)	(0.057)	(0.305)	(0.057)
$DIPJ_2$	-1.1151[a]	-0.2472	-0.3513	0.5277	0.7975[b]	-0.2164	0.8328[a]
	(2.739)	(0.813)	(0.732)	(0.639)	(1.966)	(0.576)	(0.272)
$DIPJ_3$	n.a.	-0.2250	-0.0508	-0.4313	0.2909	0.5149	0.8989[b]
		(0.509)	(0.080)	(0.321)	(0.447)	(1.069)	(2.272)
$DIPJ_4$	-1.2634[a]	0.2225	0.9301	3.2564[b]	-0.9088	0.8884	-0.1967
	(1.741)	(0.424)	(1.055)	(2.412)	(0.809)	(1.552)	(2.272)
$DIPJ_5$	-0.9709	0.1654	1.1977	0.1403	-0.1470	0.0679	-0.2113
	(0.951)	(0.256)	(1.475)	(0.457)	(0.199)	(0.100)	(0.295)
$DEGJ_2$	-0.0085	0.3087	0.0145	-1.4403[a]	-0.2521	0.4732	-0.0302
	(0.024)	(0.898)	(0.031)	(1.798)	(0.558)	(1.147)	(1.031)
$DEGJ_3$	n.a.	1.8062[a]	0.0444	-1.7916[a]	-0.8676	-0.2415	-0.7784[b]
		(4.449)	(0.075)	(1.708)	(1.339)	(0.452)	(2.002)
$DEGJ_4$	-0.2262	1.0358[a]	-1.4878[a]	-3.5282[b]	-0.1426	0.0523	-0.3121
	(0.459)	(2.295)	(1.779)	(2.472)	(0.024)	(0.095)	(0.078)
$DEGJ_5$	0.5733	0.4841	-1.5815	-1.6562	-0.7812	-0.6912	-0.5951
	(0.696)	(0.715)	(1.248)	(1.189)	(0.831)	(0.579)	(0.820)
Family							
1PAR	0.4811	-0.3916	-0.6661	0.5498	0.0682	0.1782	-0.7657[b]
	(1.224)	(1.097)	(1.231)	(0.623)	(0.148)	(0.440)	(2.170)
HI_2	-0.3806	-0.1446	-0.7482[a]	0.5636	0.3208	0.3918	0.2969
	(1.007)	(0.506)	(1.813)	(0.838)	(0.755)	(1.052)	(1.029)
HI_3	0.1425	-0.7429[a]	-1.1487[b]	0.3926	0.5111	-0.2989	0.8298[b]
	(0.309)	(1.890)	(2.056)	(0.387)	(1.023)	(0.639)	(2.493)
PEDUC	-0.2166[c]	-0.0634	-0.0866	-0.1208	-0.2241[c]	-0.1667[c]	0.0774[a]
	(4.046)	(1.162)	(1.094)	(1.022)	(3.054)	(2.712)	(1.705)
$PJOB_1$	-0.4227	0.1986	0.8414	-1.0695	-0.5601	-1.4642[a]	-1.4920[c]
	(0.773)	(0.383)	(1.005)	(0.897)	(0.845)	(2.444)	(3.086)
$PJOB_2$	-0.5796	-0.2765	0.5790	-0.4807	0.4592	-0.8258	-1.1079[b]
	(0.806)	(0.423)	(0.546)	(0.328)	(0.596)	(1.227)	(1.976)
$PJOB_3$	-0.6813	-0.1532	1.0570	-1.2562	0.4810	-1.0225	-1.6767[b]
	(0.904)	(0.229)	(1.049)	(0.802)	(0.597)	(1.332)	(2.577)
$PJOB_4$	-1.0451[a]	-0.1105	0.9465	0.5842	-0.3325	-1.2212[a]	-1.4881[c]
	(1.678)	(0.198)	(1.031)	(0.487)	(0.457)	(1.900)	(2.924)
$PJOB_5$	-1.2910	-0.3834	1.2112	-12.957	-1.0297	-0.5222	-0.7401
	(1.626)	(0.565)	(1.164)	(0.051)	(1.037)	(0.718)	(1.303)
$PJOB_6$	-0.8710	-0.8149	0.7839	-2.4487	0.0529	-0.0542	-0.6165
	(1.186)	(1.224)	(0.769)	(1.466)	(0.066)	(0.082)	(1.107)
$PJOB_7$	-1.3850	-12.496	-10.241	-11.578	0.1765	-1.3497	1.6705[a]
	(1.218)	(0.070)	(0.062)	(0.045)	(0.124)	(1.015)	(1.949)
Individual							
FEM	-0.0567	0.0048	-2.4273[c]	-1.7212[a]	0.9413[b]	0.3437	0.2731
	(0.184)	(0.020)	(4.409)	(2.430)	(2.810)	(1.189)	(1.246)
$HOURS_2$	-0.0260	-0.7667	0.5884	0.7514	-0.1470	0.0679	-1.0720[b]
	(0.038)	(1.387)	(0.643)	(0.457)	(0.199)	(0.100)	(2.031)
$HOURS_3$	n.a.	-1.0082[a]	0.9574	2.3225[a]	-1.4658	0.1573	-0.7763
		(1.843)	(1.080)	(1.696)	(1.632)	(0.237)	(1.536)
$HOURS_4$	0.8300[a]	-0.8508[a]	0.5300	2.6855[b]	-0.1524	-0.4684	-1.4356[c]
	(1.786)	(1.729)	(0.062)	(1.959)	(0.233)	(0.782)	(3.097)
$HOURS_5$	0.6633	-1.0042[a]	0.9519	0.6066	-0.0352	-1.2102[a]	-0.5011
	(1.338)	(1.933)	(0.114)	(0.447)	(0.052)	(1.920)	(1.077)
$SOUTH_2$	-0.3446	0.8600[a]	-0.4025	-2.5141[a]	-0.4790	0.1004	0.0298
	(0.702)	(1.916)	(0.638)	(2.363)	(0.851)	(0.176)	(0.071)
$SOUTH_3$	n.a.	0.8133[a]	-0.2697	-1.1199	-0.5383	0.3589	0.3727
		(1.704)	(0.413)	(1.125)	(0.913)	(0.625)	(0.840)
$SOUTH_4$	-0.7942[a]	0.2009	0.0478	-1.2761	-0.9083	0.7455	0.4659
	(1.714)	(0.430)	(0.787)	(1.344)	(1.624)	(1.343)	(1.110)
$SOUTH_5$	0.7095	0.3534	-0.2636	-2.2882[a]	-1.6507[b]	0.7319	0.0111
	(1.465)	(0.657)	(0.380)	(1.665)	(2.529)	(1.155)	(0.024)
$NEAR_2$	1.6369[c]	-0.3897	-0.1889	-0.4063	-0.7956	-1.4053[b]	0.2479
	(4.301)	(0.761)	(0.308)	(0.313)	(1.134)	(2.445)	(0.571)
$NEAR_3$	n.a.	0.4487	-1.2185[b]	0.2058	0.0416	-0.8709[a]	0.4431
		(0.986)	(2.035)	(0.165)	(0.069)	(1.757)	(1.080)
$NEAR_4$	1.1434[c]	-0.1902	-1.0909[a]	0.8870	0.3501	-0.7095	-0.2011
	(2.928)	(0.385)	(1.757)	(0.679)	(0.558)	(1.393)	(0.446)
$NEAR_5$	1.2787[b]	0.7683	-2.5514[b]	0.2182	0.3161	-1.9804[a]	-0.8862
	(2.050)	(1.231)	(2.047)	(0.134)	(0.351)	(1.722)	(1.190)
Chi-square	119.54	103.78	66.38	66.91	62.91	51.98	172.07
Number of respondents in group	74	116	44	21	52	61	192

Figures in parentheses are t-statistics.

[a] Significant at the 10% level of probability.
[b] Significant at the 5% level of probability.
[c] Significant at the 1% level of probability.

move 3 hours away from home to secure employment. Positive coefficients on and significance of $SOUTH_2$ and $SOUTH_3$ indicate a willingness to move out of the south.

Armed Forces Model

Those who plan to join the armed forces have several characteristics in common. The negative coefficient on $DEGJ_4$ implies that this group tends to have a less positive perception of local employment opportunities for college graduates. The negative coefficients on HI_2 and HI_3 mean that individuals who choose to join the armed forces are generally from lower income families, while the negative coefficient on *FEM* indicates that a higher proportion of males plan to join the armed forces. The negative and generally increasing magnitude of the coefficients on the *NEAR* variables indicates that those who plan to join the service do not feel obligated to remain in the community after completion of high school.

Trade School Model

The negative coefficients on the school district variables in the *TRADE* model are indicative of the larger proportion of Kentucky students who plan to go to a trade school. This result likely reflects the better developed system of vocational schools in Kentucky. In Virginia vocational training is provided by the community college system. The positive coefficient on $DIPJ_4$ indicates a more positive perception of local employment opportunities for high school graduates. However, the negative coefficients on three of the *DEGJ* variables as compared to the omitted variable mean that those who plan to go to a trade school have less positive perceptions of local employment opportunities for college graduates. Males are more likely than females to plan to go to a trade or vocational school.

The results of the *TRADE* model show a more complex willingness to move. Two of the *HOURS* variables are positive, indicating a higher willingness to move three hours away from home to get a job, while two of the four *SOUTH* variables indicate a reluctance to move out of the south to obtain employment. Perhaps the individuals in this group, since they have a more positive perception of local employment opportunities, believe that moving more than three hours away from home is unnecessary, but that it may be necessary to move a shorter distance away from home to secure suitable employment.

Community College Model

The results of the *2YEAR* equation indicate that those who choose to go to a community college have parents with a generally lower number of years of formal education. Females have a tendency to choose this option more than males, perhaps because the two options most similar to attending a community college—trade schools and the armed forces may be perceived as oriented toward males. $DIPJ_2$, being positive, shows only a minor favorable perception of local employment opportunities, while the negative coefficient on $SOUTH_5$ indicates a low willingness to move out of the south. Taken together, it appears that this group values additional education but is less willing to relocate to obtain it.

Transfer Student Model

Those individuals who plan to attend a community college and then transfer to a four-year institution tend to live in families of less educated parents who are less likely to have jobs as tradesmen or as production workers. The results also show that individuals in Virginia are more likely to choose this option, perhaps because of the more extensive community college system. The willingness of the members of this group to move appears to be mixed. The negative coefficient on $HOURS_5$ indicates a lower willingness to move, while the negative coefficients on *NEAR* imply a higher willingness to move.

Four-Year Model

The results of the *4YEAR* model provide the most robust results, perhaps because the largest number of responses were in this group. It may also be because these students have given their plans more consideration, since they likely had already applied for college admission at the time of the survey. These individuals have a somewhat negative perception of local jobs for college graduates but are somewhat more positive about local jobs for high school graduates. However, it may be that the

availability of jobs for high school graduates is irrelevant since they likely do not anticipate competing for such jobs.

The socioeconomic background variables tend to separate this group from the rest, as they tend to come from two-parent, higher income families whose parents are more likely to have a professional or managerial occupation. The only willingness to move variables that are significant ($HOURS_2$ and $HOURS_4$) indicate a low willingness to move a shorter distance from home. However, the willingness of many of these students to attend college outside their community is an indication that many are willing to move away from home. A cross-tabulation of the data shows that those who plan to go to a four-year college or university tend also to have a higher willingness to move out of the South. However, the effect of this factor on educational plans may have been overshadowed by other factors, particularly the socioeconomic variables.

Summary

The findings presented here tend to support the hypothesis that the willingness to move influences plans to acquire additional education. Of the seven models, only *TRANS* and *ARMED* showed a consistently high willingness to move. *DROP*, *JOB*, *TRADE*, and *2YEAR* were expected to exhibit a low willingness to move. This was generally true in each case, except for the dropout group, which had the highest proportion expressing the *highest* willingness to move both three hours away and out of the South. Further, the dropouts had the highest proportion expressing the *lowest* willingness to move both three hours away and out of the south. Hence the dropout population generally has strong views about the willingness to move, but these views differed widely among individuals in the group. The *TRADE* model showed gradations of the willingness to move, with a high willingness to move a shorter distance from home and a reluctance to move out of the South. The other exception is that the *JOB* group showed less willingness to move three hours away from home, but a higher willingness to move out of the South.

The results were moderately supportive of the hypothesis that local employment opportunities influence educational aspirations. Both the dropouts and those planning to go to a four-year college had the most negative perception of local employment opportunities for high school graduates. The lack of opportunities may have had a positive influence on the decisions of those planning to go to a four-year college by reducing the expected opportunity cost of going to college. Those who plan to attend a trade school have a more positive perception of local opportunities, which perhaps influenced their decision to acquire vocational training, the skills from which may help them compete for the available jobs.

Several data problems existed which may explain the weak performance of *DIPJ* and *DEGJ*. First, there is little variation in the data because a large proportion of the population had negative perceptions of the job market for those with a high school diploma. Also, there likely exists a high correlation between the perception of local employment opportunities and the school district in which one resides. This is to be expected because there are real differences in employment opportunities, and these differences are likely reflected in perceptions. For example, the local economy of Montgomery, Virginia is generally healthier than those of the other three districts. A comparison of frequency distributions of the four districts shows that 39 and 58 percent of respondents in Montgomery, Virginia have at least neutral perceptions of job opportunities for high school and college graduates, respectively, compared to 17 and 28 percent for the other three districts combined. Given the structure of the models, these differences are likely to be reflected in differences in the school district dummy variables.

Conclusions

Economic and social conditions in Appalachia are generally below those of the rest of the United States, despite decades of government programs to eradicate these problems. An important reason for the poor economic condition of Appalachia and other rural areas may be a lack of personal investment in education. Under-investment in education causes further declines in the productivity of the local labor force, which weakens the ability of such communities to attract and retain

employers who pay higher wages and who require higher skilled workers. Technological change in traditional rural industries will likely continue to shrink demand for unskilled, low-wage labor. If under-investment in education continues, it is likely that these conditions will continue or worsen. A successful economic development strategy designed to improve conditions in rural areas should acknowledge that these factors have a powerful influence on how hard students are willing to work in school and the amount of education or training one receives. By increasing the local economic payoff to education we can increase the incentive to acquire education, and perhaps begin to reverse the trend of declining economic opportunity in many rural areas.

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Endnotes

1. The dropouts responded on a four-point Likert scale, omitting "neither agree nor disagree". As a result, dummy variables for this response are omitted in the Dropout model. The response choices for "somewhat agree" and "somewhat disagree" were also slightly different on the dropout surveys–"tend to agree" and "tend to disagree" were used.

2. In this study the only data drawn from the parent surveys was household income and the number of years of school completed by the parent.

3. The classification system used is a modification of a categorization system used by the United States Department of Labor.

4. The survey instrument used in Kentucky used slightly different wording. Instead of move "out of the South" it was worded move "further north than Kentucky or Virgina."

5. There were only 8 responses for become a homemaker. Therefore, this variable was combined with those who intended to get a job to define a group as not continuing their education after completing high school.