The Effects of Community Economic Conditions on Education Decisions

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ED147   Sociology of Children and Adolescents
SO 187.33   Geographic Information Systems

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December 15, 2005

Introduction

High school and post-secondary education are more intimately linked to labor market chances due to changes in the American economy. Education is seen as a tool for economic survival. This project explores the seemingly economically irrational decision to abandon the attainment. Human capital theory views the pursuit of education as a conscious investment made by the individual. Economic models have emphasized the critical value of time investment decisions. Economists view education as an investment because individuals incur costs (one can pursue alternative activities) with the expectation of a higher return than the next best course of action of education under the current economy. High school dropout decisions are particularly interesting because of the intersection of diminishing restrictions by parents, increased personal responsibility, and critical timing as a transition period. This project examines if community characteristics, particularly regional market conditions, provide an explanation for the geographical difference in adolescent decision-making.

Globalization and the Hour-Glass Economy

Globalization has transformed the national economy from a primary product and manufacturing economy to a service and information based economy. Sociologists Douglass Massey and Deborah Hirst, in their study of the US occupational wage structure, assert that the disappearance of manufacturing jobs from out-sourcing has limited opportunities for those with middle levels of education while increasing the wage-earning opportunities for those with high and low levels of education. The ideological shift in firms' mass production processes has also devalued middle levels of education. Previously, firms relied on large bureaucratic organizations whose hierarchical structure had a place for individuals with high, middle, and low levels of education. Firms now utilize "flexible production techniques carried within small, lean, non-hierarchical settings,"[1] and consequently put a premium on high-education workers.

Massey and Hirst argue that an hour-glass economy was shaped by wage difference and educational levels. Specifically, high school dropouts had a pyramid like distribution in which few dropouts earned high wages while many earned low wages. College graduates had an inverted pyramid in which many earned high wages and fewer graduates earned low wages. High graduates had an hour-glass structure with some earning high wages, some earning low wages, and few earning intermediate wages.

Their study, which covers the period 1949-1989, highlights education's influence in determining position on the wage structure. Massey and Hirst highlight the disappearance of middle rungs on the social mobility ladder. Gainful employment has been a vehicle for upward mobility. The restriction on mobility has significant consequences on outlook and future planning.

Joblessness and Outlooks on the Future

William Julius Wilson, in his examination of the persistence of urban poverty, has identified neighborhood joblessness as a primary reinforcer of black poverty. Unemployment and non-participation in the labor market suppress any movements out of poverty. He states that broad economic changes are contributing to the persistence of poverty; He notes that technological innovation, "the shift from goods-producing to service-producing industries, the increasing polarization into high wage and low wage sectors," periodic recessions, and the "growing suburbanization of jobs" have increased the rate of inner city joblessness.[2]

Wilson asserts that joblessness has both negative material and psychological consequences. He examines the interpretation of symbols and the internalization of group identities in his discussion on the outlooks. Wilson posits that irregular employment results in the "lack of a coherent organization of the present" and consequently the absence of "a system of concrete expectations and goals." Joblessness also deters "rational planning in daily life."[3] Rational decision-making requires the ability to assess future outcomes. Poverty reproduction and persistence provides evidence for the internalization of adult outlooks by adolescents.

Joblessness' effect on expectations and goals greatly influences an individual's cost-benefit analysis and decision making. Nancy Lopez, in her book Hopeful Girls, Troubled Boys, examines the interaction of employment, outlook, and education decisions in a series of interviews with inner city young adults. In her conversations with high school graduates, drop-outs, high-risk graduates, and dropouts who later pursued more education, she examines how economic conditions are interpreted by individuals who are about to enter the labor market. She attributes the higher dropout rates of males to men's marginalization in the workplace. The elder males, those already in the labor market, were often between jobs, and those with college degrees faced difficulties in finding gainful employment.[4] She found that the experiences of the elder males of the community were internalized in the outlooks of young males resulting in the devaluation of education.[5] Lopez presents a clear case in which community economic conditions influenced adolescent decision-making.

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Hypothesis

Massey and Hirst have highlighted the influence of globalization, changes in industry, and the polarization of wages in an hour-glass economy. They also noted that the opportunities for upward mobility are restricted in regions that follow the hour-glass structure. Wilson identifies neighborhood joblessness (irregular unemployment, low labor force participation) as critically affecting individual experiences. Industrial shift, further polarization into high and low wage sectors, and the suburbanization of jobs inflate inner city joblessness. He asserts that economic outcomes do affect decision-making through the distortion of outlooks, particularly the inability to rationally evaluate the future consequence. Lopez in her interviews with inner city young men provides evidence that adolescents take into consideration the actions taken by older community members. She provides the theoretical framework through which this study is based by observing the link between community conditions and individual decision-making. The incorporation of broad community outcomes into educational attainment decisions provides the key causal argument. Without the internalization of community outcomes into rational decision-making, there is no causal argument, and this inquiry measures associations rather than causality.

This paper seeks to find whether a link between community conditions (county economic indicators) and individual decision-making, measured in dropout rates, exists in the state of Texas in 2000. The economic indicators identified as salient by the previous sections include: measures of joblessness, both unemployment and labor force participation, metropolitan designation (urban, suburban, rural), dominant occupation and industry type, and the degree of wage polarization in a given economic body.

I infer that economic conditions will affect adolescent decision-making in these ways:

a) High unemployment and low labor force participation result in higher dropout rates.
b) The suburbanization of jobs results in higher dropout rates in rural and urban areas.
c) Larger percentages of high-skill/high education occupations and industries result in higher dropout rates. Larger percentages of low skill occupations and industries result in higher dropout rates.
d) Higher wage differences in occupations and industries, as predicted by the hour-glass structure, result in the restriction of social mobility and higher dropout rates.

Data and Methods

Dropout rates from the year 2000 were gathered from the National Center for Education Statistics (NCES) and the Texas Education Agency (TEA). Though measures were available for the smaller administrative unit of the school district, county dropout rates were used because of their compatibility with economic data. The TEA and the NCES rates were inconsistent because the accounting formulas for dropout rates were different; substantial difference between the rates was a result. Ultimately, the county dropout rates from the TEA were used because a more local administrative body will likely be more accurate.

Measures of joblessness, unemployment and labor force participation rates, were gathered from the U.S Census Bureau website. Civilian and non-civilian measures of employment were combined to find county (un)employment rates. Metropolitan designation (rural, suburban, urban) was also calculated from Census 2000. The Census does not provide urban clusters, only rural areas. The Metro codes provided by the Economic Census are representative of the years 1992 and 2003, and comparisons show substantial change in categorical definition. For temporal consistency, Census 2000 data was used to create an urbanization rating which allowed for an urbanization spectrum.

Urbanization Rating = (% housing units in rural areas) * 1 + (% housing units in urban clusters) * 3 + (% housing units in urban areas) * 5

The percentages for Occupational and Industry categories were also recorded. Census 2000 utilized a different occupational classification system than the 1990 and 1980 Censuses that stratified occupational categories based on knowledge, skill level, and experience needed. Census 2000 uses the 1998 "job families" coding structure which grouped occupations on the "similarity of the goods and services produced."[6] It is more difficult to interpret and place the current occupational categories in a hierarchical order of skill. The Occupational Categories are:

Management, professional, and related occupations   Farming, fishing, and forestry occupations   Construction, extraction, and maintenance occupations
Service occupations   Sales and office occupations   Production, transportations, and material moving occupations

Industry categories were more numerous and consequently, occupations in these categories were more centrally related. They include:

Agriculture, fishing, and hunting   Construction   Finance   Information   Manufacturing
Educational, health, and social services   Professional, scientific, and management   Wholesale   Retail   Public Administration
Transportation, warehousing, and utilities   Arts, Entertainment, recreation, accommodation, and food services   Other

Census 2000 did not provide Occupation or Industry-specific income or earnings measures on which wage polarization can be calculated. Counties with low numbers of high school students were excluded in order to diminish the possible skewing of the data. The number of counties decreased from 254 to 222 in this first data set.

A second data set was created from the Bureau of Economic Analysis. The industry categories were similar, and industry-specific earnings were available for a majority of the counties. Average industrial earnings were calculated by dividing the county's various industry earnings by the number of people employed in each industry. Confidentiality issues resulted in the censoring of county earnings. Counties with incomplete or non-comprehensive information were excluded. The number of counties decreased from 222 to 134 in this second data set. The degree of wage polarization was calculated by 1 averaging the top 4 and bottom 4 earning industrial categories and finding the difference between the two measures. In using the top and bottom 4 earning occupations, at least 40% of the county working population is being compared (low 20% vs. high 20%).

Exploratory Spatial Analysis using ARCGIS was used to provide early estimations of dependent-independent variable association. The data set was divided into quantile categories for selected independent variables. Counties were distributed into high, middle, low, dropout rate groups with an equivalent number of cases in each group. Quantile categorization was also used for the selected independent variables (i.e. high, middle, low unemployment groups). The independent variables were then matched to the high dropout rate group. Testing hypothesis 1, high unemployment counties were matched with high dropout rates; low labor force participation counties were matched with high dropout rates. The number of matches was divided by the group sample size to determine match rate. Exploratory analysis provides support for hypothesis.

Table 1   N=222 Statistical summary

Exploratory Analysis of Hypothesis

High Unemployment & High Dropout Rates

Match = 41%

Hypothesis was explored by matching high dropout rate counties with various independent variables. The match rate was also calculated and provided early estimations of variable association.

Texas Counties Dropout Rates

Match   Non-Match

High Service Occupations & High Dropout Rates

Match   Non-Match

Match = 38%

High Management and Professional Occupations & High Dropout Rates

Match   Non-Match

Match = 45%

Variable	Match Rate
Labor Force Participation	41
Urbanization Value	59
Industry: Manufacturing	24
Industry: Information	21
Industry: Services	38
Wage Difference	36

Discussion

Regression analysis, based on the OLS, was performed using GEODA software. Models were created and progressed from univariate analysis of community measures to multivariate analysis with the increasing addition of community economic variables. Model 1 shows the analysis of dropout rates with the measures of joblessness as covariates. Model 2 incorporates a county's urbanization into Model 1. Model 3 introduces occupational category onto Model 2 while Model 4 incorporates industrial categories onto Model 2. Model 5 uses the smaller subset of 134 counties and incorporates wage polarization in the regression equation.

Since the variables measured are economic conditions, there is a possibility for spatial dependence, when the observed values depend on the values observed in neighboring counties. Regression diagnostics were performed on the various models to check for spatial dependence. Tests of the lag and error are not significant. Model 4 had low probabilities on 2/3 tests for heteroskedasticity and 2/6 tests for spatial dependence. A spatial lag model was operated on model 4, and the general model fit slightly improved, raising the values of R2 from .2044 to .2075 and Log likelihood from -561.81 to -561.416. Model 5 had high probabilities on all 3 tests for heteroskedasticity, and the omission of many neighbors due to the smaller dataset limits tests for spatial dependence. Table 2 shows regression analysis for all models with values from Model 4 coming from the spatial lag model.

Figure 5

Exclusion of Rural and Low Employment Counties

Dataset 2 & Urbanization values of excluded counties

Dataset 2 & Unemployment rates of excluded counties

(N=134) dataset 2
Excluded (rural counties with high unemployment)

The black counties are rural and have high rates of unemployment; their exclusion (a total of 37 cases) distorted the data set. The findings from Model 5 are weakened by the disproportionate omission of cases with high unemployment and low urbanization values, which previous models have indicated as significant. The substantial increase in the R^2 values is likely attributed by the 39.6% decrease in sample size.

Results

The univariate analysis initially provides evidence for the effects of joblessness, urbanization, and occupational categorization but not wage polarization. Consistent with the arguments of Massey, Hirst, and Wilson, counties with higher level jobs (higher percentages of Management and Professional jobs) had lower dropout rates while counties with higher percentages of services jobs had higher dropout rates. Counties with higher percentages of sales and office-related jobs also had higher dropout rates. Surprisingly, counties with higher percentages of agriculture, forestry, fishing, and hunting had lower dropout rates while the dropout rates of counties with higher percentages of service industry further give support to arguments of Massey, Hirst, and Wilson.

Model 1 tested the variables of community joblessness. The negative relationship tied with labor force participation in the univariate analysis disappears while unemployment rates still had a significant influence on dropout rates. Model 1 suggests that seeing community members' inability to obtain work impacted education decisions more than being in an environment in which a higher percentage of the community was part of the labor force. Urbanization was an additional factor in Model 2. Not only was a greater degree of the variance explained by the inclusion of the urbanization variable (increasing the R2 from 0.1213 to .1597), urbanization had an influence on dropout rates when unemployment and labor force participation are controlled. As counties become more urban, adolescents are dropping out at higher rates. Since arguments exist for both occupational and industrial composition and data was readily available, occupational composition was added to Model 2 in Model 3, and industrial composition was added to Model 2 in Model 4.

Table 2 Regression Analysis

The figures for Model 3 show that the significance of the management and professional, service, and sales and office categories gathered from univariate analysis disappear when unemployment and urbanization are introduced. The figures for Model 4 show the significance of agriculture, fishing, forestry, and hunting, service, and retail disappear (though to a lesser extent) when unemployment and urbanization are introduced. Model 3 and Model 4 show that unemployment and urbanization continue to have a significant effect on dropout rates.

Model 5 uses the smaller dataset that allows for the introduction of wage polarization in the regression equation. The comparison of the R2 values from Model 3 and Model 4 show that occupational composition provides a slightly better explanation for dropout rates, and therefore, occupational composition was used in Model 5. The figures show that wage polarization was not a significant determiner of dropout rates and that surprisingly, unemployment rates have lost their significance while urbanization still maintained its significance.

Regression analysis from Model 1 to Model 4 shows that unemployment and urbanization are significant determiners of dropout rates. The strong relationship for unemployment rates disappears in Model 5; however, this is likely due to the decrease of cases in the dataset. The censoring of earnings data disproportionately excluded rural counties with smaller populations which tend to have higher unemployment rates than suburban and metropolitan areas.

The analysis from Models 1 through Model 4 yields mixed results on the effect of community economic conditions on the education decisions of adolescents. A county's rate of unemployment and degree of urbanization were significant variables while labor force participation, occupational composition, and industrial composition were not influential. The findings on urbanization are not surprising and are consistent with previous research. Urbanization brings with it a plethora of conditions that affect many aspects of an adolescent's life. The interesting findings concern the variables which Massey, Hirst, Wilson, and Lopez have identified as potentially being internalized by adolescents in their investment decisions.

Again, the theoretical framework of this inquiry asserts that the economic outcomes of community members are being interpreted and incorporated in the education decisions of adolescents who have yet become full members of the labor market. Adolescents as rational decision makers are intelligently using adult references, with which conceivably, they share similar attributes by virtue of being part of the same community, in their cost-benefit analysis. The results show that for the most part, amid the incoherence between community adults perform, only negative economic outcomes are being incorporated into decision making. Being in an environment where a higher percentage of one's neighbors and community members have a desire to work and are part of the labor force does not really matter in education attainment decisions. Being in an environment where a greater degree of community members have highly valued and highly skilled jobs does not matter; neither does being in an environment in which most community members have low value and low skilled jobs.

The insubstantial influence of community labor force participation can be attributed to many conditions. First, at some point in the life course, most individuals must reach a period of self-sufficiency, in which gainful employment must be pursued. Adolescents come to this realization eventually; substance is condition specifically directed towards the individual, and the behaviors of others would not seriously affect a basic goal. Second, labor force participation is a measure of desire, willingness, and ability to work. Labor force participation rates measure more static characteristics of the community rather than providing the consequences of a specific type of action.

Occupational and industrial composition also failed to have a significant influence on education decisions. The percentage of manufacturing, management and professional jobs, service, and agricultural jobs did not play a significant role as predicted. One reason for insignificant results is the overarching reach of American individualism. The pillars of individual autonomy, competition, and self-interest support the ideal of rugged American self-determination.[7] Occupations and industries have varied educational and skill requirements. That the occupational and industrial choices of older members of the community had little influence on the education attainment decisions provides evidence for the shared belief in self-determination. The occupational choices of others are seen as having little bearing on the occupational choices of the adolescent. While there is evidence for the substantial influence of parental education attainment on the education investment decisions of children, it appears that educational attainment related to occupational and industrial requirements cannot be similarly identified as an important factor.

Similarly with the strength of relationship with the community also provides an explanation of the regression results. Nancy Lopez asserts that the outcomes of older males in their neighborhood were internalized by adolescent males. The transcript of her interviews highlight that the outcomes of friends played a role in the individual's decision making process. The influence of parental educational attainments also provides evidence for the role of social closeness to the decision maker; the decisions and outcomes of people who are socially close to the individual reasonably play a stronger role in the cost-benefit analysis of the individual. If similarity to the model plays a significant role in internalization of the model's outcomes and decisions, the examination of an administrative body smaller than the county may yield different results by virtue of increasing the social closeness within unit members. Another reason for insignificant results is the substantial lateral mobility in the county. Individuals can simply move if a county's occupational and industrial composition is poor fit with their qualifications, expectations, and goals.

However, despite arguments for individualism and lack of social closeness, unemployment appears to play a significant role on education decisions. Unemployment is composed of three parts: desire/ willingness to work, active search for work, and the outcome of not finding work. The inconsistency between adult and result violates expectations of the rewards to effort. Education is an investment requiring effort and time with expectations of later rewards. The American narrative stresses hard work and persistence as means to upward mobility. The effort-reward relationship is so generic and so widely believed that despite the lack of strength of social closeness attributed to the bigger administrative unit of the county, being in an environment in which effort-reward expectations are violated influences rational decision making. Education and employment share the similar construct of effort-reward. Adolescents, who have yet become full members of the labor market, are especially affected by the violation of expectations. Counties with high unemployment rates, environments where efforts are not justified, have adolescents who have substantially devalued education.

Conclusion

This inquiry explored factors incorporated in education investment decisions. County economic conditions were used to determine whether community characteristic in general have an effect on decision-making and specifically, whether the decisions and outcomes of older community members were internalized into the rational cost-benefit analysis of adolescents. I find that the general measure of urbanization had an effect on dropout rates while adolescents for the most part are discounting the decisions and outcomes of adults in regards to labor force participation, occupation type, and industrial preference. The American belief in self-determination plus the weak strength of social closeness attributed to the unit of analysis are the likely causes of the insignificant relationship found. However, despite arguments for individualism and lack of social closeness, the unemployment of community members are being incorporated in the education investment decisions of adolescents. I attribute the internalization of American effort-reward narrative and education to similar structure of present effort for delayed rewards as the likely explanations that the violation of expectations in the labor market of community members significantly affects the education investment decisions of high school students. Further inquiry, which analyzes a smaller administrative body that conceptually results in units with more socially proximate members, should be undertaken to determine the strength of individual's internalization of other's decisions and outcomes.