Risk Attitude and College Attendance

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Abstract

This paper documents the relation between risk attitude and college attendance. A measure of the degree of risk aversion is constructed based upon the National Longitudinal Survey for Youth. Statistics and estimation results suggest that risk aversion may have a negative impact on the decision to attend college. Several potential endogeneity problems are discussed. (Key words: risk aversion, schooling choice; JEL: J310)

1 Introduction

If investing in college education is risky, individuals who are more averse to risk are less likely to enroll in college. It has been documented that there is much uncertainty about the returns to college education (Becker, 1963 and 1993; Weiss, 1972; Mincer, 1974; Olson, White, and Shefrin, 1979; Chen, 2003 among others).[1] Yet, no one empirical study to data examines the impact of risk attitudes on the decision to attend college. This note estimates the magnitude of that impact. My analysis starts with constructing a measure of risk aversion using the National Longitudinal Survey for Youth (NLSY). Baseline statistics show that a higher level of schooling is associated with a lower level of risk aversion. The level of risk aversion is almost uncorrelated with family income. Probit estimations suggest that risk aversion has a negative impact on college attendance. In addition, I find that family income has almost no effect on college attendance. Several potential endogeneity problems are discussed.

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[1] In contrast, Belzil and Hasen (2002) find that an increase in risk aversion will increase the level of schooling attained.

2 Data on Individual Risk Attitudes

A dummy variable (r_i) is constructed to measure an individual's level of risk aversion in the following manner. The 1993-wave of the NLSY offers respondents between ages 28 and 36 hypothetical lotteries over their family income. The first lottery offers respondents a 50-50 chance to double their family income or reduce their family income by one third. If respondents decline the first lottery, they are offered a more profitable lottery — lottery-A, a 50-50 chance to double their family income or reduce their family income by 20 percent. On the other hand, if they accept the first lottery, they are offered a less profitable lottery — lottery-B, a 50-50 chance to double their family income or reduce their family income by one-half. Notice that the expected values of these three lotteries are all greater than family income. Respondents who decline the best two offers (i.e. the first lottery and lottery-A) are labelled as *highly risk-averse* ($r_i = 1$); all other respondents are labelled as *not highly risk-averse* ($r_i = 0$).[2]

In the NLSY random sample, 5505 respondents revealed their risk attitudes by answering the questionnaire. Excluding 146 respondents who attended college in or after 1993, forty-six percent of the sample are identified as highly risk-averse. Statistics show that a *higher* level of schooling is associated with a *lower* level of risk aversion: Of high school graduates who did not attend college, 51.4 percent are identified as highly risk-averse, whereas of those who attended college, only 42.8 percent are identified as such. For respondents who attended a four-year college, the percentage is reduced to 41.4 percent, compared to 46.0 percent for two-year college attendees. In addition, I find no evidence that risk attitudes is correlated with family income; the absolute value of the correlation coefficient between r_i and family income is smaller than 3 percent. Detailed definitions of variables employed here are defined elsewhere (Chen 2003 among others).

3 Schooling Choice Models

A binary choice model is considered, $d_i = I\{x_i'\beta + \varepsilon_i > 0\}$, where d_i indicates the decision to enroll in college, β is a vector of parameters; $I\{.\}$ is an index function, taking the value one if its argument is true, and zero otherwise. The regressor x_i is a vector of explanatory variables, including risk attitude r_i, family income at age 14, a dummy variable of missing the family income variable,[3] the

[2]Several studies have pointed out that behavior in abstract lotteries may not correspond to risk behavior in contextual decisions (Schubert, Brown, Gysler, and Brachinger 1999; Hershey and Schoemaker 1980).

[3]Almost half of the random sample have the family income variable missings, because the cohorts in the initial survey year were older than 16-17 and thus did not report their family income for those ages. A dummy variable is assigned to indicate the missing family income information. Restricting to the group that reported family income, I examine its effect on the regression results. I find that the family income variable (and the dummy of missing family income information) is insignificant with respect to college attendance and does not noticeably change the other coefficients; the coefficients of Afqt, gender, and parental education are close to the results in Table 1. In addition,

log of local cost of attendance at the county level, the Armed Force Qualification Test (Afqt) score, parental education, gender, race, regional dummies, the year graduated from high school (hgy), hgy squared, and a constant. The error term ε_i captures the unobservable individual factor that governs the decision to attend college. ε_i can be normalized as a random variable with zero mean and unit variance for a given set of parameters β. Assuming that ε_i is independently normally distributed, I use a probit to estimate the parameters.

4 Results

Table 1 considers three alternative probit models. As a benchmark, the first column does not control for risk attitudes; it shows the importance of race, gender, academic ability, and parental education to the decision to attend college. Individuals whose parents are college-educated are 23 percent more likely to enroll in college than those whose parents are not. Given other characteristics, African-Americans are 21 percent more likely to attend college than non-African-Americans. Women are 6 percent more likely to attend college than men. As an extreme example, an academically talented African-American female whose parents are college-educated is more likely to attend college than any other type of individual. Notably, family income has almost *no* impact on the decision to enroll in college in all of the models. This might result from a large number of missing observations or measurement errors. In addition, row (a) indicates that the local cost of attendance has a strong negative effect on the schooling decision; a one-percent increase in the cost of attendance may lead to a 4 percent decrease in the college enrollment rate with a p-value almost equal to zero.

The second column includes the dummy variable r_i in row (j) to control for levels of risk aversion. The risk-aversion dummy has a significant effect on the probit model; the extent of the effect is comparable to the effect of an one-percent increase in cost of attendance. Individuals who are highly averse to risk are 4 percent less likely to enroll in college than those who are not. Note that the effects of race, gender, and parental education slightly increase when the risk aversion dummy is included. If attending college is riskier for certain groups of people, other things being equal, those who are more risk-averse are less likely to go to college.

It could be that non-African Americans, males, and individuals whose parents are less educated are more hesitant to attend college (as shown in columns (1) and (2)) since attending college is riskier for them relative to others. To test this conjecture, column (3) shows interaction terms for risk aversion with race, gender, and parental education. The coefficients of the interactions indicate that both parental education and race affect the influence of risk aversion on the schooling decision at a 10 percent significance level, while gender has almost no effect. In particular, adding the interaction term reduces the negative effect of risk aversion for individuals whose parents are

replacing the family income variable with log of family income or dummies of income levels generates similar results.

college-educated. Adding the interaction term even offsets the negative effect of risk aversion for African Americans. These results suggest that attending college are perceived to be riskier by non-African Americans relative to African Americans, and riskier by individuals whose parents are less educated relative to those whose parents are college educated.

5 Concluding Remark

If investing in a college education is risky, risk aversion discourages college enrollment. This paper empirically examines this hypothesis by using NLSY to construct a dummy variable that measures individual levels of risk aversion. Statistics show that a higher level of schooling is associated with a lower level of risk aversion. After controlling for family income, individual ability, and demographics, a probit analysis suggests that risk aversion has a negative impact on college attendance. This result supports the notion that investing in a college education is perceived to be risky. In particular, I find that the educational investment is perceived to be riskier by non-African Americans relative to African Americans, and riskier by individuals with less-educated parents relative to those with more-educated parents.

These findings, however, have endogeneity problems, since the questions about risk attitudes in NLSY were asked after most respondents had finished college education. It is possible that college education influences the attendee's attitude toward income risk. For instance, Solmon (1980) and Poterba and Wise (1996) have documented that, holding income as constant, more-educated individuals are more likely to invest in equity securities relative to the less-educated.[4] Provided that college education makes people better able to cope with income risk, college attendees may have greater tolerance for lotteries than non-attendees. As such, the results of my estimation overstates the effect of risk aversion on the decision to attend college.

To investigate the extent of this endogeneity problem, I examine the channel from schooling to risk aversion, controlling for individual demographics and family income in 1993 (when the questions about lotteries were asked). I instrument the schooling decision variable using the log of local cost of attendance at the county level when the respondent was 17 years old. The instrumental estimation shows that college attendance has almost no impact on the risk-aversion dummy,[5] suggesting that the extent of this particular endogeneity problem is moderate at the most.

Another concern of endogeneity is interactions between student financial aid and the willingness to take risk. Student financial aid may generate an income effect that encourages risk-taking behavior. As a result, fixing individual characteristics, aid recipients are more likely to prefer

[4] As noted by Michael (1982), however, the effect of schooling on portfolio choice may reflect the effect of schooling on income. No empirical study to date has successfully separated these two effects.

[5] The estimation results are available upon request.

lotteries than other college attendees. Assessing the importance of this endogeneity problem is left for future research.

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Table 1: Risk Aversion and College Attendance.

College enrollment	**Changes in Probability (p-value)**		
	(1)	(2)	(3)
1. Explanatory variables:			
a. Log cost of attendance	-.039	-.039	-.039
	(.000)	(.000)	(.000)
b. High school graduation year	yes	yes	yes
	(.000)	(.000)	(.002)
c. Afqt scores	.008	.008	.008
	(.000)	(.000)	(.000)
d. Parental education	.227	.239	.208
	(.000)	(.000)	(.000)
e. Family income (thousands)	.002	.002	.002
	(.199)	(.209)	(.233)
f. Missing family income	.045	.038	.038
	(.107)	(.196)	(.201)
g. Black	.214	.225	.184
	(.000)	(.000)	(.000)
h. Female	.063	.066	.067
	(.000)	(.000)	(.001)
i. Regional dummies at age 17	yes	yes	yes
	(.001)	(.007)	(.006)
j. Highly averse to risk	-	-.044	-.072
		(.004)	(.002)
k. Highly averse to risk	-	-	.069
× Parental education			(.051)
l. Highly averse to risk	-	-	.085
× Black			(.061)
m. Highly averse to risk	-	-	-.001
× Female			(.974)
2. LR test, chi-squared	1292.15	1230.45	1237.030
3. Number of respondents	4643	4332	4332

Note: (i) The changes in probability are evaluated at the sample means of other variables. (ii) This table is based on the random sample of NLSY. (iv) "Parental education" means whether a respondent's parent attended college.