"The Impact of Working while Enrolled in College on Wages"

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By

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Abstract

Those students who work while enrolled in college are investing in their human capital, and therefore, corporations looking to employ new workers entering the labor market may favor these types of students, and create incentives for non-working students to seek employment. Using NLSY97 data, this paper finds that working while enrolled in college decreases the wages one receives. Therefore, students who are not working while enrolled in school may have higher grades and graduate more frequently on time, causing firms to hire the non-working students more favorably.

I. INTRODUCTION

After students complete a high-school level of education, they must decide whether or not to continue their education by entering either a two-year or four-year college. Students who choose to attend college upon graduating high school increase their opportunities to earn higher future wages in relation to students who do not choose to continue their education after high school. US Census Bureau research has found that "the difference in work-life earnings between workers with a high school diploma and those with a college degree is about $1 million" (Julian 2011), thus representing the importance of a college education. Because the costs to attend college continue to rise, it may be increasingly necessary that a student work while enrolled in college to finance their schooling or to remain at their current level of consumption. Working while enrolled in college may increase the value of a students' work experience, measured using Mincer's (1994) human capital earnings function, in addition to being an important determinant of future earnings (Molitor and Leigh 2005). The values gained by a student that cannot be measured through developments within a classroom setting are marketable ability, responsibility, interpersonal skills, better work habits, higher motivation, a 'foot-in-the-door' connection, etc. As a result, student employment raises future productivity through skills, knowledge, work habits, and experience more than it detracts from human capital investments (Ruhm 1991). If students who work during college are investing in their human capital, corporations looking to employ new workers entering the labor market may favor these types of students, and create incentives for non-working students to seek employment.

Greenberger and Steinberg (1982, 1986) discover negative schooling outcomes to conclude that working is more likely to interfere with schooling, promote immaturity, and in some circumstances lead to higher drug and alcohol use. Based on these previous conclusions,

students may choose not to work while enrolled in school due to the trade-off relationship between the time spent studying/ attending class and the time required for work, expected time of graduation, probability of dropping-out of school, and other negative effects as previously defined. Ehrenberg and Sherman (1987) showed that weekly hours of work has an adverse effect each year on the probability that a student will remain enrolled in school the following year; and for those who remained enrolled, it reduces the probability of graduating on time. Therefore, students who are not working while enrolled in school may have higher grades and graduate more frequently on time, causing firms to hire the non-working students more favorably.

On the other hand, previous literature also found that those students who work while enrolled (in college) exhibit higher resiliency towards graduating, and when using categorical explanatory dummy variables, effects measured of students under 'school only' categories have a bigger impact on wages than 'school combined with work' activities (Light 2001). These differing effects between the variables of working while enrolled during college on future wages may provide support for either private or governmental development of work-based education programs, in addition to changing student decisions of loans/financing available, as it relates to seeking employment during the school year. The contradictions in previous research are significant to labor market economics due to the utility maximization of students' seeking employment, the budget constraints created through financial aid availability, the future wage levels measured in labor markets, as well as the policy implications for state and local governments.

II. Conceptual Framework

Because of the proven benefits of enrolling in college, students are forced to address contradicting utility maximizing behaviors as it relates to accepting a job or not. The overall

costs to attend college are increasing at an increasing rate, and therefore it is more expensive for students to attend school, maintain their current consumption levels, and add value to their work experience. These increasing costs, along with the expectations of maintaining acceptable grades and receiving financial aid, create a trade-off function of the behaviors of enrolled students. Student employment decisions are made simultaneously with the availability of scholarships, financial aid, the rate of borrowing money, in addition to the required hours worked per week. I will account for these controls to properly identify the causal relationships between labor market payoffs, i.e. wages received, and the realized effects captured when a student chooses to work while attending school.

Therefore, it is important for students to properly assess the trade-off between studying and working. In so doing, students are able to measure the necessity and amount needed to work as it coincides with desired consumption levels. This assessment of personal consumption and time will form students' utility maximization function of time spent while enrolled in school. If an enrolled college student is evaluating the costs /benefits of seeking employment, the student must measure the gains from being employed simultaneously with the potential losses to schooling estimates. In other words, for a student to seek employment, the gains to a students' human capital earnings function (Miner 1994) must be larger than the losses of financial aid surrendered. However, the previous rule does not address that the returns to schooling may be positively correlated with the personal attributes gained from working. If this relationship exists, then labor market payoffs will be causally related to student employment.

By reconciling Mincer's (1994) human capital earnings theory, Light's (2001) 'school-plus-work' environment, and the schooling estimates for both two-year and four-year institutions in Ehenberg and Sherman (1987), I will be able to estimate the differences in effects of the

employment status of students on the future wages. I propose that working while enrolled in college increases the future wages one receives upon entering and remaining in the labor market.

III. DATA

The main data set is collected using databases from the National Longitudinal Survey of Youth 1979 Child/Young Adult cohort (NLSY79). The NLSY79 consists of a nationally representative sample of approximately 12,000 men and women born between 1957 and 1964. Since 1986, detailed information on the development of children born to women in the NLSY79 cohort has supplemented the data on mothers and children collected during the main NLSY79. The children of these women are the main data providers for the individual-level data sets used in this analysis. I include race, sex, age, sibling composition, and information on whether the individual in those years worked while attending school, received financial aid, took out loans, and the wages received by the individuals in 2010.

I establish indicators of the individual's sex (*Male, Female*), race/ethnicity (*Non-Black Non-Hispanic, Black, Hispanic*), and the sibling composition (*Siblings, No Siblings*) of the individual. The outcomes of employment and schooling measures are constructed based on the individual responses to the questions *"Did you work for pay after school? Did you receive any form of financial aid from the college you attended? Did you take out a loan for school?*" These questions are appropriate when studying the wage impacts of working while enrolled in school, since those who work while enrolled may be receiving less financial aid and have high amounts of loans, causing lower wages thereafter. The estimation strategy used in this paper requires expansion according to individual employment (*Fulltime, Part-time*) and financial aid levels (*Full Financial Aid, Some Aid*). Similarly, the wage levels of those individuals are rounded to the

nearest $500 in the range provided in the study, and natural log wages are generated to assess the labor market value of in-school and post-school skills with respect to the GNP Deflator in 2010.

Table (1a) contains the means, standard deviations, number count, definition, and source of all variables. In order to expand on the restrictions in Molitor and Leigh (2005), I have revised the data set to individuals over the age of 16. This ensures that each child of the original cohort has completed schooling and eligible for work, as of 2010 (the last year used in this analysis). Of the 1,124 individuals aged 16 and older, 262 worked fulltime while in school, and 190 worked part-time. Additionally, 234 students received financial aid in the form of a full scholarship, 283 received partial financial aid, and 248 took out loans. In 2010, the mean level of wages was $18,561.80, with the highest earner making $300,000, seen in Table (1a). The natural log of wages received measured against returns to schooling effects, and whether the student is employed or not, will allow me to draw conclusions concerning labor market payoffs in relation to being employed while enrolled.

IV. Empirical Framework

To provide evidence that a positive relationship exists between the returns to schooling and the attributes one receives by working, I suggest that the returns to schooling are aided by the fact that one who is employed benefits from those attributes gathered outside of the classroom. Consider Equation (1) below, where *Wage* represents the natural logarithm of the wages of individual *i* in 2010 as a function of the individual's age, sex, race, schooling estimates, plus an error term.

$$(1)\ Wage_i = Bo + B1Race_{iy} + B2Sex_{iy} + B3Age_{iy} + B4Schooling_{iy}{}^{*} + E.$$

However, I will be testing the schooling returns of those that work while enrolled in school in relation to the schooling returns of those that do not to work in school. Therefore, the *Schooling*

and *Employment* estimates must be calculated to capture effects of both 'working students' and 'part-time working students'. Shown in Equations (2) and (2.1):

$$(2)\ Employment^*_{iy} = go + g1FullTime_{iy} + g2PartTime_{iy} + u.$$

$$(2.1)\ Schooling^*_{iy} = do + d1FinancialAid^*_{yi} + d2Loan_{iy} + e.$$

The amount of financial aid received by non-working enrolled students is compared to the amount of financial aid received by the employed students. Consolidating the returns to schooling estimates in Equation (2.2), we see that the returns to *Financial Aid* captures differing effects due to student decisions of the time-studying vs. time-working trade-off function as it relates financial aid availability/necessity to work.

$$(2.2)\ FinancialAid^*_{iy} = a0 + a1FullFinancialAid_{iy} + a2SomeFinancialAid_{iy} + u.$$

The resulting coefficients of the financial aid effects will explain the marginal effect on wages, when in-school work experience is omitted. Equation (2) derived with (2.1) and (2.2) helps form the testable regression model, and can be seen in Equation (3); where $Wage^*_i$ is the log wages of individual *i* in 2010. $Employment^*_{iy}$, $Loan_{iy}$, and $FinancialAid^*_{iy}$ represent the levels of schooling/employment estimates when work experience and financial aid are grouped by intensity.

$$(3)\ Wage^*_i = B0 + B1Race_{iy} + B2Sex_{iy} + B3Age_{iy} + G4Employment^*_{iy} + D5FinancialAid^*_{iy} + L6Loan_{iy} + E.$$

Equation (3) may suffer from an endogeneity problem due to ability bias not only with the causal effects of work experience, but also with respect to the schooling returns. For example, smarter and more motivated students are likely to receive higher wages whether they work while in school or not. To account for the bias, I will instrument for wages using family

background characteristics not correlated with the wages one receives. In so doing, I will be able to get a better representation of the impact that employment while in college has on one's wages.

V. RESULTS

The first relationship posed in the previous section concerns the sensitivity of labor market returns to schooling effects to the inclusion of student employment. Seen in Table (2), column (1) represents wage estimates calculated excluding a measure of employment experience, while column (2) includes the employment controls. OLS estimates in the wage model for the coefficients of *sex*, *age, aid*, and *work* are statistically significant in explaining changes in wages. I calculate the percent change in predicted wages with and without employment controls to examine the magnitude of employment experience while enrolled in college. A change of 0.26% in wages results when accounting for college employment, yet, the direction of the coefficient implies that a student's decision to start working while enrolled causes a $0.042 (-0.26%) decrease in wages. The schooling (*financial aid* and *loan*) and employment (*Full-time* and *Part-time*) coefficients show jointly, but not individual significance in explaining wages. Also, the estimated employment coefficients are not significantly different from financial aid, but are significantly different than loan coefficients. Failure to account for employment experience leads to the returns to wages that are biased. As proposed by Light (2001), even though students may have non-random decisions concerning the choice to work, it is not, however, determined simultaneously with the wages one receives. The solution is that all of the individuals in the sample have similar unobservable characteristics, and therefore, if the omitted individual characteristics drive wages, the influence is similar for all individuals in the sample.

In order to properly estimate equation (3), I must use an instrumental variable (IV) method to control for bias captured in the coefficients. I use the family background

characteristic, *Sibling Composition*, as the instrument for schooling. Family background variables can explain much of the variation in financial aid and loan estimates because they reflect heterogeneity in tastes and income levels. Butcher and Case (1994) and Light (2001) present evidence of negative effects between men and women who have siblings and the amount of schooling completed. Parents may be substituting their financial resources between siblings or cannot afford to send additional children to college due to increasing costs. *Sibling Composition* is unlikely to be correlated with unobserved factors that explain wages, and therefore is a valid instrument. *Sibling Composition* is a dummy variable, which takes the value of one to indicate that the individual has a brother/sister, and zero otherwise. Examining the first stage regression, I conclude that the instrument is strong based on the F-statistic (186.97) being greater than 10, as well as the estimated coefficient for sibling (0.57) being positively related to employment decisions. If parents are paying multiple college tuition fees, the probability that their child seeks employment increases by 0.57 due to their inability to provide the same level of financial help as they would with fewer children.

Seen in Table (3), the estimates for the coefficients of *work* (-0.162) and *sex* (-0.074) are statistically and economically significant, however once again, the regression produces a result separate from my hypothesis, i.e. if a student decides to work while in college, his/her wages are expected to fall by $0.16. If a student is taking out a loan to pay for college, the probability that the student seeks employment increases by 0.08. Similarly, for every additional loan received by a student, the wages they receive is expected to drop by $0.03.The coefficients of employment and schooling measures (*work*, *financial aid*, *loan*) are jointly and individually significant (0.0001) in explaining changes in wages.

Conclusions:

Instead of making a clean transition from college into the labor market, many students gain valuable work experience while still in school. Assessing the effect that working while enrolled in college has on the wages of an individual, I conclude that student employment detracts from the wages one receives. Over the span of 4 years in college, a student that is employed can expect his wages to decrease by $0.64. In both OLS and IV regression models, the coefficient of employment measure is negative, however is economically significant. Employment in college is an important determinant of wages, however firms are not favoring those students who work while enrolled and the potential losses to grades, due to time spent working, may be causing lower wages for working students. Student employment causes students to spend more time at work, less time studying, and as a result, lower wages. My advice for college students would be to avoid employment, if possible, because there are no wage benefits from acquiring work experience.

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Tables and Figures:

Table (1a): Summary Statistics

VARIABLE	OBS	DEFINITION	SOURCE	MEAN	S.D.	MIN	MAX
RACE	1124	Race of Individual	NLSY97	2.69	-0.59	1.00	3.00
YOB	1124	Year of Birth	NLSY97	1986.54	-5.56	1971.00	1997.00
AGE	1124	Age of Individual	NLSY97	26.46	-5.56	16.00	42.00
SEX	1124	Sex of Individual	NLSY97	1.49	-0.50	1.00	2.00
WAGE	1124	Total wages of individual in 2010	NLSY97	18561.80	9524.91	3500.00	300000.00
LNWAGE	1124	Natural log of wages/GNP Deflator	NLSY97	5.09	-0.31	3.46	7.91
WORK	1124	Employment status of individual in college	NLSY97	0.35	-0.48	0.00	1.00
AID	1124	Financial Aid status of individual in college	NLSY97	0.38	-0.49	0.00	1.00
LOAN	1124	Loan Standing of individual in college	NLSY97	0.22	-0.41	0.00	1.00
SIBLING	1124	Sibling Composition of individual	NLSY97	0.42	-0.49	0.00	1.00

Table (2): OLS Estimates of Wage Model

	(1)	(2)
VARIABLES	LNWAGE	LNWAGE
RACE	0.000432	3.29e-08
	(0.0157)	(0.0157)
SEX	-0.0654***	-0.0676***
	(0.0181)	(0.0181)
AGE	0.00559***	0.00372*
	(0.00170)	(0.00195)
AID	-0.0493*	-0.0447*
	(0.0256)	(0.0257)
LOAN	0.0188	0.0223
	(0.0297)	(0.0297)
WORK		-0.0426*
		(0.0219)
CONSTANT	5.049***	5.115***
	(0.0722)	(0.0798)
OBSERVATIONS	1,124	1,124
R-SQUARED	0.024	0.027

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table (3): IV Regression Estimates of Wage Model

	(1)	(2)
VARIABLES	WORK	LNWAGE
RACE	-0.00101	-0.00121
	(0.0176)	(0.0159)
SEX	-0.0126	-0.0740***
	(0.0203)	(0.0184)
AGE	-0.0165***	-0.00153
	(0.00222)	(0.00240)
AID	0.00215	-0.0319
	(0.0290)	(0.0262)
LOAN	0.0843**	0.0322
	(0.0331)	(0.0301)
SIBLING	0.568***	
	(0.0241)	
WORK		-0.162***
		(0.0383)
CONSTANT	0.549***	5.301***
	(0.0913)	(0.0942)
OBSERVATIONS	1,124	1,124
R-SQUARED	0.501	0.001

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Figure (4):

Ho: variables are exogenous

Durbin (score) chi2(1) = 14.9282 (p = 0.0001)

Wu-Hausman F(1,1116) = 15.0214 (p = 0.0001)

Figure (5): OLS Fitted Values vs. Residuals