Term Time Employment and the Academic Performance of Undergraduates

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Abstract:

This paper outlines a framework for evaluating the decision of undergraduate students to engage in term-time employment as a method of financing higher education. We then examine the impact of work on academic achievement and find that employment has modest negative effects on student grades, with GPAs falling by 0.007 points per work hour. We use a unique custom dataset based on students at a traditional regional state university that provides information on student motivations and allows us to directly address some of the endogeneity problems that affect existing literature. We find that students who work for primarily financial reasons earn lower grades than students who work for career-specific skills but higher grades than those students motivated by a desire for general work experience.

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Graduating high school seniors are presented with a choice to either enter the work force or attend college, and more and more their decision has been to do some of each. Nearly half of all four year college students were employed in October 2006, up from about one third in 1970 (U.S. Department of Education 2008). The allocation of time between work and study has potentially important implications for their earnings profiles in the future. With the increasing role of employment in education finance, comparing the rates of return of employment-financed education to loan-financed education can provide important insights for students and policy-makers. Term time employment offsets some of the opportunity cost associated with attending college and may provide additional human capital in the form of on-the-job training, but it also may distract students from their studies, leading to lower levels of learning, longer time to degree, lower graduation probability and a less attractive GPA to present to potential employers upon graduation. This study examines the effect of term time employment on academic performance for students at Winona State University, a regional state university in Minnesota made up primarily of traditional students who come directly from high school, live on or near campus but away from their parents, and take a full time course load with an eye toward graduation in four years. We carefully distinguish between students who work primarily to finance their education and those who work primarily for other reasons.

This project makes use of survey data on students over the years 2004-2008 and finds that an increase in work hours has negative effects on grade point average (GPA). These findings are robust to a number of specifications and controls, including variations in work hours

for the same individual. Our research design allows us to make two significant improvements over previous research that struggle to address endogeneity bias in the work-school decision. We use a differencing model to control for individual-specific characteristics that influence the decision to work. We also surveyed students about their motivations to work in an effort to disentangle those students who are working with an eye toward increasing their stock of human capital from those who are working for other reasons. An examination of students' motivations for work shows that students who work in order to gain skills specific to their desired career path perform better in the classroom than students who work for other reasons.

This study begins with a review of the existing literature on the relationship between schooling, experience, and earnings and on the link between term time employment and academic performance. The second section describes the survey instrument and data. The third section presents the empirical model and results. The final section concludes and suggests some implications for understanding earnings profiles and investments in human capital.

I. LITERATURE REVIEW

The human capital earnings function most commonly presented in the literature takes the form of what has come to be known as the Mincerian equation, which expresses earnings as a function of schooling, experience, and the square of experience (Jacob Mincer, 1974). The standard form of the human capital earnings function is

$$ln\,(\text{Earnings}) = a + b\,\text{Schooling} + c\,\text{Experience} + d\,\text{Experience}^2 + \varepsilon \qquad (1)$$

This specification is frequently augmented to estimate compensating differentials or rates of return to different kinds of investments in human capital. Often, schooling is represented as years of schooling and experience is represented as working years since the completion of

schooling (see David Card, 1999 for an overview). Yet introducing overlap between work and schooling confounds the traditional approach. Additionally, simply using years of schooling fails to account for differences in school quality and academic performance. To date, very little work has been done exploring how term-time employment affects earnings profiles and the measured rate of return to schooling.

This study focuses on one piece of that puzzle, namely how term time employment affects student academic performance. Term time employment potentially enters the earnings function in three places. First, it impacts experience directly, providing some on-the-job training, either skill-based or general. Second, it affects the amount of learning and human capital accumulation done by students who choose to allocate some of their time to labor market activities. Third, it might affect students' grades, which provide signals to prospective employers. Working students may study less, earn lower grades, or choose a less demanding major, so simply using years of schooling or degree status may not accurately capture the dimensions of schooling that influence future earnings. It should be noted that the decision to work may be optimal in spite of its deleterious effects. The experience gained may boost future earnings, and the part time earnings will offset some of the cost of foregone earnings associated with attending college. It may also lengthen the time to degree. Barry Chiswick (1998) discusses how an inability to account for these issues will influence the interpretation of the estimated return to schooling in the basic human capital earnings function.

Figure 1 illustrates three representative earnings profiles—one for no college, one for college without employment, and one for college with employment. Working during college offsets some of the earnings difference between full time workers and full time students. It may also lengthen the time to permanent attachment to the labor force, increase the starting wage, and

affect the slope of the earnings profile into the future[1]. If we define the employment-financed earnings profile as E(t) and the loan-financed profile as L(t), the decision to finance education is based on the following rule. If

$$\int_{18}^{T} \frac{E(t) - L(t)}{r(t)} dt > 0 \qquad (2)$$

where 18 is the age at which students enter college, T is the age at which earnings desist, and *r(t)* is the (potentially time-varying) discount rate, then employment-financed education is the optimal decision. Note that the left hand side of equation (2) represents the discounted difference in the earnings streams.

Despite the important link between term time employment and schooling and labor market outcomes, very little work has been done examining the link between term time employment and academic performance of undergraduates. Prior studies fall in to two broad categories—national studies based on longitudinal data in the National Longitudinal Survey of Youth (NLSY) (Ronald Ehrenberg & Daniel Sherman, 1987; Charlene Marie Kalenkoski & Sabrina Wulff Pabilonia, 2009) and studies based on a single school (Ralph Stinebrickner & Todd Stinebrickner, 2003) or small group of schools (Claire Callender, 2008). Each of the national surveys suggests a negative relationship between employment and GPA. The advantages of a national dataset are the ability to generalize to a broader group of students, yet the studies that have been done are not able to distinguish between differences in universities. Focusing on a smaller population results in some loss of generality, but eliminates the problem of trying to measure differences in the relationship between work and academic performance from across a

[1] Hotz et. al. (2002) estimate the return to working during school with a primary focus on work during high school based on an examination of different earnings profiles.

heterogeneous set of colleges and also allows for a richer set of control variables. Stinebrickner and Stinebrickner (2003) focus their study on students at Berea College, a small liberal arts college targeted to low-income students and with a mandatory work-study program. They find a negative impact of work hours on GPA, and are careful to discuss sources of bias in Ordinary Least Squares (OLS) estimates, particularly bias related to the endogeneity of the work-study decision. The concern is that students who see themselves as having a low probability of graduation or a low motivation to earn good grades will find it more important to engage in term-time employment, or perhaps that able students who can sufficiently take care of their study will engage in term-time employment. The authors suggest that the bias is likely to be smaller with data that contains information on worker motivation. The survey data used in our study is aimed directly at bridging this gap. In a broader survey on schools in the UK, Callender (2008) finds a negative relationship between student employment and student performance, but does little to address the potential endogeneity problem.

This study departs in a number of ways from previous studies. First, we focus our study on Winona State University, a much more traditional college than the very unique Berea College and one that is representative of a wider class of United States universities. We also make use of a very detailed dataset that allows us to exploit variations in an individual's work hours and employment status throughout their academic career. Presumably, most of the unobservable characteristics of a particular student that influence both work and academic performance will remain the same across time. Additionally, we address the concerns noted in Stinebrickner and Stinebrickner (2003) about understanding student motivations for employment by directly surveying students about their motivations.

II. DATA

This study focuses on students who attended Winona State University, a public university located on two campuses in Southeastern Minnesota, between 2004 and 2008. Winona State students are primarily traditional students, particularly at the main campus located in Winona. In the fall of 2007, 7,472 students were enrolled at the main campus, and an additional 788 were enrolled in Rochester. 92% of the students were enrolled full time, 95% of students have parents who reside outside Winona, 99% of the students entered Winona State at age 21 or younger, with 98% entering prior to age 20. 33% of students live in campus housing. Over 99% of the student body comes from four states—Minnesota, Illinois, Wisconsin and Iowa. Eighty eight percent of students identify themselves as Caucasian, and the other ethnicities make up less than 2% of the student body. 61% of students are female. While the relative homogeneity of the population makes generalization of these results inappropriate for more diverse student bodies, Winona State is representative of a mid-sized state university serving traditional students. U.S. News and World Report classifies Winona State as a comprehensive, regional public Master's university, alongside schools like Missouri State University, University of Colorado-Colorado Springs, Western Carolina University, and SUNY-Fredonia (U.S. News and World Report 2009).

Each February, Winona State holds an assessment day in lieu of regularly scheduled classes, and as part of the assessment day, they administer a survey to the students. The survey is voluntary, and so not completely random, but the university offers incentives to participate and participation rates are fairly high. 3,632 students completed the survey in Spring 2008, which is slightly less than half the student body, and response rates range between 45% and 55% over the

period of study. The survey asks a number of questions of each student, and their responses are matched with information from the admissions office on a number of characteristics. For the past four years, the university has collected data on hours worked and self-reported hours spent studying. In 2008, a number of questions were added to the survey, including whether the respondent receives course credit for their employment, whether they work on campus or off campus, and how many hours per week they study. Additionally, students who worked were asked to rate the importance of a number of factors on their decision to work. The admissions office provided data on GPA, high school rank, ACT scores, self-reported parental income and work status, permanent zip code, credit hours attempted and earned, and major field of study.

The dataset contains information on the surveys administered in February 2005, 2006, 2007, and 2008 for students who initially enrolled in Fall 2004 or later. A change in computer systems at Winona State makes it difficult to obtain a full set of control variables for students who enrolled prior to 2004, and no employment data exists for records prior to 2004 in any case. While an overwhelming majority of students at Winona State are traditional students, there are some who are commuters or local residents enrolled part time. Rather than confound the results with nonrepresentative students, a subset of students were dropped from the analysis. Students who were older than 20 years of age when they entered Winona State and students who indicated they worked more than 30 hours per week were dropped from the analysis. Observations with missing data for hours worked were also dropped from the sample. There are also a number of missing responses for parental income, ACT scores, and high school class rank that reduces the usable sample. This resulted in a panel that included 6,992 observations on 4,140 individuals. Descriptive statistics are provided in Table 1. The dataset contains 935 responses to the 2005

survey, 1,637 responses to the 2006 survey, 2,219 responses to the 2007 survey, and 2,201 responses to the 2008 survey.

The mean GPA was 3.07, and the mean hours worked among those who worked was 14.4. 49% of students in the sample engaged in term-time employment. On average, students who worked carried a 3.12 GPA, while non-workers carried a 3.03 GPA. The average student reported studying 15 hours per week, with workers reporting 15.2 hours and non-workers reporting 14.9 hours. There are very few differences in the characteristics of workers versus non-workers. Workers are somewhat more likely to be liberal arts majors, and somewhat less likely to be education majors. The incoming high school class rank was the 71st percentile for workers, compared with the 69th percentile for non-workers. Mean Composite ACT scores were 22.8 for both groups. Workers self-reported lower parental incomes than non-workers, $69,671 for the former and $82,806 for the latter. Just 3% of workers earned credit for their employment. 21% held an on-campus job.

Table 2 reports the results of the survey administered to employed students in February 2008 regarding their motivations for work. They were asked in five separate questions to rate the importance of five factors on their decision to work by choosing one of four categories: Not important, somewhat unimportant, somewhat important, or very important. These categories were assigned values from 1 to 4. The factors were: earning money to pay tuition, earning spending money, developing skills specific to their future career, gaining general work experience, and making friends. 54% of respondents indicated that earning money to pay tuition was very important, the highest rate in the survey, while just 16% said the same about making friends. In general, the motivation for spending money has the highest mean (3.28) and lowest variation (0.83) while the motivation for making friends has the lowest mean (2.50).

III. ECONOMETRIC ANALYSIS

The analysis below examines the effect of term time employment on student grade point averages. GPA is first modeled as a function of employment characteristics, student quality, and a number of control variables:

$$GPA = f(\mathbf{W}, \mathbf{Q}, \mathbf{Z}) \quad (3)$$

W represents a vector of employment characteristics, including the number of hours worked, whether the work is for course credit, and whether the work is on campus or off campus. The vector **Q** includes the student's comprehensive ACT score and high school class percentile rank as measures of student quality. The control variables included in **Z** include the number of hours enrolled, the number of hours previously acquired, field of study, family characteristics, and year-fixed effects. Results of OLS (Model 1) and Tobit regressions (Model 2) are presented in Table 3. The Tobit regressions account for the bounded nature of the dependent variable,[2] since GPA is constrained between zero and four. For interpretation purposes, average marginal effects are included in the table as well. The marginal effects reported represent the average impact on GPA of an incremental change in the explanatory variable for each observation in the dataset. True marginal effects vary with changes in the levels of the explanatory variables.

As expected, the quality of the student as measured by high school rank and composite ACT score is positively related with GPA at 1% significance level. One extra point on the ACT

[2] See (William Greene, 1993) for a full discussion of Tobit regression.

composite predicts approximately extra 0.03 points in GPA, and one percentile higher in class rank adds approximately 0.01 points in GPA. We included college fixed effects to control for college-specific differences in grading standards and found that the field of study matters as well. Education, Liberal Arts, and Nursing & Health Sciences majors receive significantly higher grades than undecideds, Business, and Science & Engineering majors. Studying helps as well, with one additional hour of studying per week leading to a 0.006 point increase in GPA. Students' cumulative credit hours have a significantly positive effect on GPA (0.004 points). This may result from student improvement, easier grading standards in upper division courses, or selection bias associated with low achievers leaving the university at higher rates than high achievers. Female students earn higher GPA than males by 0.04 points. Students with both parents working earn somewhat lower grades than students with just fathers working, but family income was not found to impact grade point averages at all.

The model also included year-fixed effects to control for unobserved differences across years and found that there was significant variation from year to year in grade point averages. The external environment was generally stable over the sample period 2004-2008, though tuition increased at an annual rate of about 7% per year over the sample period. There was an small increase in the number of students participating in the Innovation Work Study program, from 28 to 55 over the period, but otherwise the university financial aid policy was substantively unchanged. We are unable to identify which students who held campus jobs were part of the Innovation Work Study program. The Innovation Work Study program essentially gives faculty and staff some increased latitude in designing work study positions but did not increase the amount of funding or change the pool of eligible students. It may have had an effect on student

outcomes, perhaps by increasing the connection between paid work and coursework, but the small number of students affected suggest that this effect should be small.

The labor market variables had significant impacts on academic performance. Off campus employment was associated with a 0.07 point increase in GPA and on campus employment was associated with a 0.20 point increase in GPA. This difference between on and off campus employment is consistent with the findings of Ehrenberg and Sherman (1987). However, each additional hour of employment reduced GPA by 0.007 points. Earlier studies (Ehrenberg and Sherman 1987, Stinebrickner and Stinebrickner 2003) find a nonlinear effect of hours worked on GPA, with marginal increases at low work hours leading to higher grades, but increases in work hours beyond some level leading to grade point average declines. We did not find this pattern in our data. There are two competing explanations for the positive effect of workforce participation yet negative effect of increasing work hours. The first one is that students who work are better students on some unobserved dimension, but that working more hours lowers their academic performance. The second possibility is that the act of working causes a level increase in GPA, perhaps by forcing the student to engage in better time management or organization, but that each additional hour of work makes it more difficult to maintain their academic performance. These two competing explanations are examined in detail below. Working for course credit did not significantly impact student GPA.

The next step was to estimate the same equation but including measures to capture the students motivation for work. Since data on student motivation is only available for 2008, observations from earlier periods were dropped from the analysis. Table 4 presents the results of OLS (Model 3) and Tobit (Model 4) models. In general, the results are similar to the results of Model 1 and Model 2. The positive impact of employment status on GPA is not statistically

significant when motivations are included. This is consistent with the hypothesis that more able students may be driven to choose work. However, the effect of an additional hour worked was to reduce grades by about 0.007 to 0.008 points. Only two motivational factors were found to influence GPA. Students who reported working for specific skills relevant to their future career earned higher grades by about 0.04 points, while students who reported working for general experience earned about 0.05 points lower grades. From the results, we can conjecture that there are two distinct groups of students that work. Students seeking career-specific skills achieve higher GPAs, while students seeking general work experience obtain lower GPAs. The former may view work as a complement to schooling in the human capital earnings function and positively self-select into employment. The latter group may view work as a substitute for schooling and thus negatively self-select into employment. We will revisit this issue below. Interestingly, the importance of earning for tuition or spending had no influence on grades, even though they were the factors most often indicated to be important or very important.

In an additional effort to disentangle whether joining the work force had a positive causal relationship with GPA or whether it was simply a matter of more talented students choosing to work, two differenced models were estimated to check the robustness of our results. The models are given in equation (3).

$$GPA_t - GPA_{t-1} = f(\mathbf{W_t - W_{t-1}, Q, Z}) \quad (4)$$

Using first differences eliminates unobservable time-invariant individual specific differences and allows for an examination of how grades change for individuals as they adjust their own working behaviors. The results of the differenced models are presented in Table 5. The dependent variable is the change in GPA. The model includes all individuals who provided

data on work hours in two consecutive years between the 2005 and 2008 surveys. The independent variables of interest are the change in work status in Model 5 and the change in work hours in Model 6. The change in work status takes the value of 1=Began work, 0=No Change, -1=Stopped work. Separating the two allows the model to capture whether increasing work effort or choosing to work is responsible for changes in GPA.

The results in Model 5 indicate that a change in work status from no work to work leads to a 0.05 point reduction in GPA for an individual. This is consistent with the hypothesis that the people who choose to work are different on some unobserved characteristic from students with similar observed characteristics who choose not to work, and that the unobserved characteristic contributes to higher grades. Model 6 shows that each additional hour of work for people who changed their work hours from one year to the next lowers grades by about 0.004 points. In both of these equations, the other explanatory variables are not statistically significant, suggesting that the effects of a change in working behavior are consistent across wide ranges of the explanatory variables.

IV. CONCLUSIONS AND IMPLICATIONS

Understanding the link between term time employment and academic performance has a great deal of value to educators and incoming students. The decision to work or not while attending college plays a key role in human capital formation during the critical transition period between full-time study and full-time employment. This paper examines the link between term time employment and academic performance at Winona State University, a primarily traditional regional public university. Our specialized focus limits the ability to draw conclusions between work and academic performance at, for instance, small liberal arts colleges or large urban

commuter schools. Further study at other types of institutions is necessary for a complete picture of the link between work and academic performance. However, Winona State University serves as a good representative of the traditional four-year in-residence state university.

The empirical analysis in this paper suggests that term time employment has a modest but statistically significant negative effect on student performance. Cross-sectional estimates suggest that one additional hour of work reduces student GPA by 0.007 points. However, the cross-sectional model suggests that choosing to work at all is associated with higher grades. To remove individual-specific unobserved characteristics from the data, the model was reestimated using first differences. The new model suggested that a person who increased their work hours by one would see approximately 0.004 point decline in GPA.

For university administrators and policy-makers, one important finding is that on-campus employment does not have as detrimental an effect on GPA as off-campus employment. This suggests that universities may gain by finding ways to move some students from off-campus to on-campus employment. The negative impact of increased work hours also suggests that universities may benefit from managing the amount of time students are permitted to work in on-campus employment. Taken together, this suggests that spreading on-campus employment across more students working fewer hours may help boost academic performance for a significant number of students. Additionally, work motivation matters to some degree. Our evidence suggests that workers who view term employment as a complement for schooling to accumulate broader human captial have better aceadmic performance, while workers who view term employment as a subsitute for schooling have worse acedemic performance. This suggests that there may be value in integrating work study positions with the academic curriculum.

Understanding the link between term time employment and academic performance is a first step toward answering the question of whether working during college is a wise decision. Future research is necessary to understand the effect that the work experience has on earnings profiles and the effect that the lower grades have on earnings profiles. Armed with that information, it would be possible and desirable to compute a rate of return to term time employment.

Figure 1. Alternative Earnings Profiles

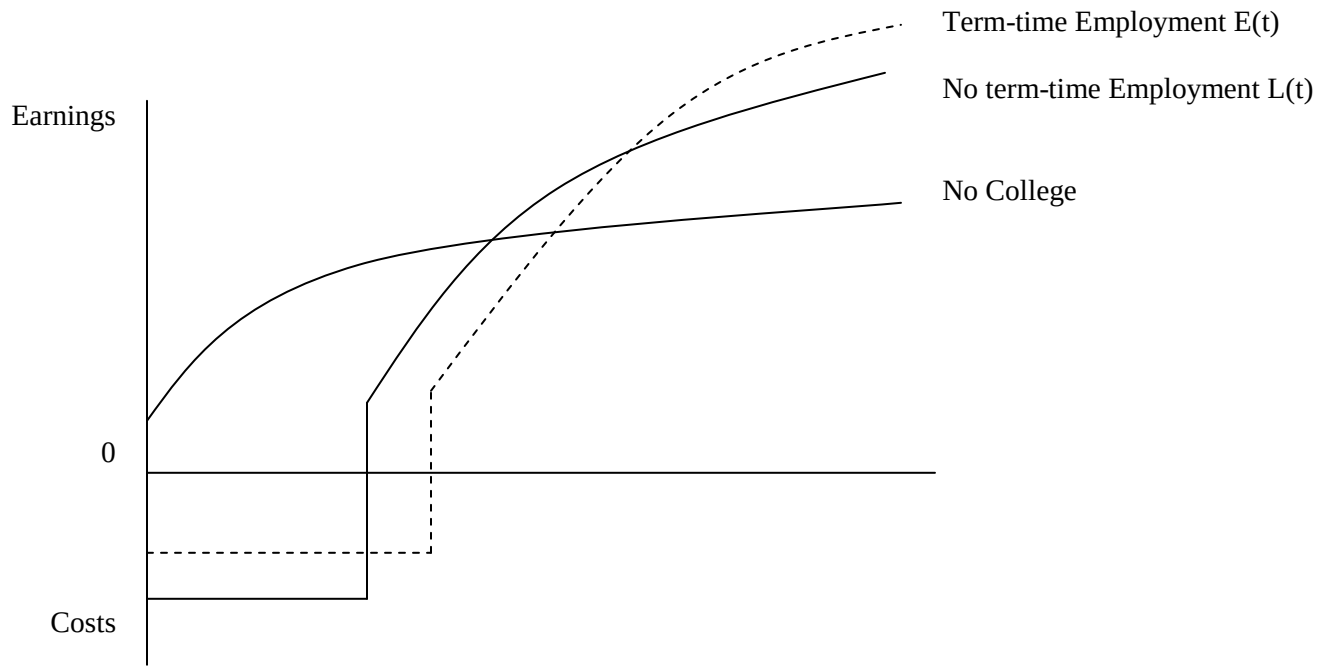

Table 1. Winona State University Student Sample Characteristics and Means

	All	Non-Workers	Workers
Number of Respondents	6992	3593	3399
GPA	3.07	3.03	3.12
	(0.77)	(0.78)	(0.76)
High School Rank	70.34	69.49	71.23
	(19.15)	(19.77)	(18.44)
ACT Composite	22.79	22.78	22.80
	(3.05)	(3.02)	(3.08)
Work Hours	7.01		14.42
	(8.79)		(7.21)
Cumulative Credit Hours	99.04	92.24	106.23
	(37.11)	(37.07)	(35.78)
Study Hours	15.06	14.91	15.23
	(9.99)	(10.05)	(9.94)
Parental Income	$76,328.71	$82,806.00	$69,670.51
	(39,266.72)	(39,937.92)	(37,420.72)
Parental Work Status			
Both Work	85.0%	84.8%	85.3%
Mother Only Works	4.8%	4.5%	5.1%
Father Only Works	9.4%	10.0%	8.9%
Neither Works	0.7%	0.8%	0.7%
Work for Credit (2008 respondents)			3.1%
Work on Campus (2008 respondents)			21.3%
Primary Major			
Business	15.6%	15.1%	16.1%
Education	14.5%	13.3%	15.7%
Liberal Arts	28.1%	26.2%	30.2%
Nursing & Health Sciences	20.3%	23.0%	17.4%
Science & Engineering	17.4%	17.0%	17.7%
Undeclared	4.2%	5.7%	2.9%
Multiple Majors	20.9%	19.5%	22.4%

In parenthesis are standard deviations

Table 2. Student Survey Response Percentages on Motivations for Work

	Motivating Factors				
Response	Pay Tuition	Spending Money	Gain Specific Skills	Gain General Experience	Make Friends
Very Important	54.03%	46.67%	35.93%	40.11%	15.91%
Somewhat Important	25.08%	40.00%	33.72%	41.21%	38.75%
Somewhat Unimportant	6.79%	7.77%	15.65%	10.31%	25.27%
Not Important At All	14.09%	5.56%	14.71%	8.36%	20.08%
Mean	3.19	3.28	2.91	3.13	2.50
Standard Deviation	1.07	0.83	1.05	0.91	0.98
Sample Size	2356	2355	2352	2356	2351

Each motivation was asked as a separate question.
Mean and Standard deviation are computed based on the assigned values (Very important=4; Somewhat important=3; Somewhat unimportant=2; Not important at all=1)

Table 3. Regression estimates of student employment effects on grade point average.

	Model 1	Model 2	
Variable	OLS Estimates	Tobit Estimates	Marginal Effect
Intercept	0.78552**	0.41825**	
	(0.09)	(0.11)	
Work Hours	-0.00722**	-0.00860**	-0.0073
	(0.00)	(0.00)	
Dummy for Work Status	0.06737*	0.08269*	0.0698
	(0.03)	(0.03)	
Dummy for Work for Credit	0.04639	0.04921	0.0416
	(0.05)	(0.05)	
Dummy for Work On-Campus job	0.13175**	0.15280**	0.1290
	(0.02)	(0.03)	
High School Rank	0.01423**	0.01596**	0.0135
	(0.00)	(0.00)	
ACT Composite	0.03186**	0.04285**	0.0362
	(0.00)	(0.00)	
Dummy for Business Major	0.08745	0.06730	0.0568
	(0.07)	(0.07)	
Dummy for Education Major	0.40572**	0.43692**	0.3690
	(0.07)	(0.07)	
Dummy for Liberal Arts	0.17995**	0.17506*	0.1478
	(0.06)	(0.07)	
Dummy for Nursing & Health	0.32923**	0.33282**	0.2811
	(0.06)	(0.07)	
Dummy for Science & Engineering	0.03907	0.01646	0.0139
	(0.07)	(0.08)	
Number of Majors, Undecided=0	0.00553	0.01482	0.0125
	(0.02)	(0.02)	
Cumulative Credit Hours	0.00357**	0.00395**	0.0033
	(0.00)	(0.00)	
Female Dummy	0.04258*	0.04849*	0.0409
	(0.02)	(0.02)	
Study Hours	0.0063**	0.00790**	0.0067
	(0.00)	(0.00)	
Both Parents Work	-0.04647	-0.07166*	-0.0605
	(0.29)	(0.033)	
Only Mother Works	-0.0154	-0.03866	-0.0326

	Model 1	Model 2	
Variable	OLS Estimates	Tobit Estimates	Marginal Effect
	(0.05)	(0.05)	
Neither Parent Works	0.12914	0.11007	0.0930
	(0.10)	(0.11)	
Parental Income	2.77E-07	0.00000	0.0000
	(0.00)	0.00	
Year 2005 Dummy	-0.28568**	-0.32117**	-0.2712
	(0.04)	(0.04)	
Year 2006 Dummy	-0.1787**	-0.20761**	-0.1753
	(0.03)	(0.03)	
Year 2007 Dummy	-0.07148**	-0.08539**	-0.0721
	(0.02)	(0.02)	
Sigma		0.648482	
		(0.01)	
N	5029	5029	
R^2	.3112		
Log Likelihood		-4920	

In parenthesis are standard deviations.
*Indicates parameter estimate is statistically significant at a 95% confidence interval.
**Indicates parameter estimate is statistically significant at a 99% confidence interval.

Table 4. Regression estimates of student employment effects on grade point averages, including motivations for work.

	Model 3		Model 4		
Variable	OLS Estimates		Tobit Estimates		Marginal Effect
Intercept	1.120501	**	0.752733	**	
	(0.16)		(0.19)		
Work Hours	-0.00758	**	-0.008771	**	-0.0071
	(0.00)		(0.00)		
Dummy for Work Status	0.05495		0.064715		0.0524
	(0.06)		(0.07)		
Dummy for Work for Credit	0.07625		0.080112		0.0649
	(0.09)		(0.10)		
Dummy for Work On-Campus job	0.15785	**	0.186858	**	0.1514
	(0.04)		(0.05)		
High School Rank	0.01460	**	0.016823	**	0.0136
	(0.00)		(0.00)		
ACT Composite	0.02616	**	0.037191	**	0.0301
	(0.00)		(0.01)		
Dummy for Business Major	-0.01044		-0.016589		-0.0134
	(0.09)		(0.11)		
Dummy for Education Major	0.35062	**	0.413858	**	0.3354
	(0.10)		(0.11)		
Dummy for Liberal Arts	0.09182		0.093182		0.0755
	(0.09)		(0.10)		
Dummy for Nursing & Health Sciences	0.17575		0.179916		0.1458
	(0.09)		(0.10)		
Dummy for Science & Engineering	-0.10063		-0.108047		-0.0876
	(0.10)		(0.08)		
Number of Majors, Undecided=0	-0.01798		-0.019639		-0.0159
	(0.03)		(0.04)		
Cumulative Credit Hours	0.00387	**	0.004333	**	0.0035
	(0.00)		(0.00)		
Female Dummy	0.08118	*	0.102568	*	0.0831
	(0.04)		(0.04)		
Study Hours	0.00593	**	0.007917	**	0.0064
	(0.00)		(0.00)		
Both Parents Work	-0.10128		-0.145040	*	-0.1175

	(0.05)	(0.06)	
Only Mother Works	-0.09345	-0.161572	-0.1309
	(0.09)	(0.10)	
Neither Parent Works	0.02668	0.051549	-0.0418
	(0.19)	(0.21)	
Parental Income		0.000000396	0.0000
		(0.00)	
Work for Experience	-0.06435 **	-0.072846 *	-0.0590
	(0.02)	(0.03)	
Work for Paying Tuition	-0.01559	-0.020579	-0.0167
	(0.02)	(0.02)	
Work for Skills	0.04794 *	0.061624 **	0.0499
	(0.02)	(0.02)	
Work for Spending	0.00502	0.001393	-0.0011
	(0.02)	(0.02)	
Work for Making Friends	-0.00634	-0.011542	-0.0094
	(0.02)	(0.02)	
Sigma		0.716191 **	
		(0.01)	
N	1846	1846	
R^2	.2898		
Log Likelihood		-1953	

In parenthesis are standard deviations.
*Indicates parameter estimate is statistically significant at a 95% confidence interval.
**Indicates parameter estimate is statistically significant at a 99% confidence interval.

Table 5. Regression estimates of student employment effects on grade point averages, using first differences.

Variable	Model 5 First Differences On Work Status	Model 6 First Differences On Work Hours
Intercept	0.37127	0.38361
	(0.21)	(0.21)
Work Hours		-0.00367**
		0.00
Dummy for Work Status	-0.0526*	
	(0.03)	
Dummy for Work for Credit	-0.07536	-0.0727
	(0.06)	(0.06)
Dummy for Work On-Campus job	0.03225	0.02863
	(0.03)	(0.03)
High School Rank	-0.00125	-0.00126
	0.00	0.00
ACT Composite	-0.00472	-0.00484
	0.00	0.00
Dummy for Business	-0.09522	-0.10264
	(0.18)	(0.18)
Dummy for Education	0.06213	0.05625
	(0.18)	(0.18)
Dummy for Liberal Arts	-0.02045	-0.02637
	(0.18)	(0.18)
Dummy for Nursing & Health Sciences	-0.05428	-0.06169
	(0.18)	(0.18)
Dummy for Science & Engineering	-0.12188	-0.13021
	(0.18)	(0.18)
Number of Majors, Undecided=0	0.00764	0.00684
	(0.03)	(0.03)
Cumulative Credit Hours	-0.00052516	-0.00052632
	0.00	0.00
Female Dummy	0.04985	0.04993
	(0.03)	(0.03)
Study Hours	0.00074714	0.00082383
	0.00	0.00
Both Parents Work	-0.02179	-0.01843
	(0.05)	(0.05)
Only Mother Works	-0.00743	-0.00582

	(0.07)	(0.07)
Neither Parent Works	-0.12237	-0.11249
	(0.16)	(0.16)
Parental Income	1.28178E-08	-6.2265E-09
	0.00	0.00
Year 2005 Dummy		
Year 2006 Dummy	0.0305	0.0305
	(0.04)	(0.04)
Year 2007 Dummy	0.00311	0.00261
	(0.03)	(0.03)
N	1993	1993
R^2	.0224	.0236

In parenthesis are standard deviations.
*Indicates parameter estimate is statistically significant at a 95% confidence interval.
**Indicates parameter estimate is statistically significant at a 99% confidence interval.

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