

Does back-to-school mean back-to-work? Examining the impact of  
financial assistance on college student employment<sup>\*</sup>

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Abstract

Rising college tuition costs may be forcing many students to seek employment during the academic term. This study employs a unique data set - a survey of financial support and employment decisions of Valdosta State University students in 2005 - to examine how the various forms of financial assistance (federal need-based aid, merit scholarships, and parental assistance) affect college student employment and academic decisions. We find that the type of financial assistance and level of assistance both have significant impacts on student employment. Students with merit-based scholarships are more likely to reduce employment hours. Parental assistance also reduces college students' labor supply; however, its impact on hours worked is considerably smaller than merit-based scholarships. Finally, students who receive need-based financial assistance do not reduce employment hours. This finding suggests that need-based assistance may not be adequately covering college expenses.

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## Does back-to-school mean back-to-work? Examining the impact of financial assistance on college student employment

### I. Introduction

The cost of attending college has increased faster than the rate inflation during the past decade. Tuition and fees between 1996-97 and 2006-07 at 4-year public universities have increased by 51% in real dollars (CollegeBoard 2006). Although increases in grants and federal tax benefits for education have partially offset some of the rising tuition costs, the net cost of attending college has still risen by 29% (in real dollars) during the ten year period between 1996-97 and 2006-07 (CollegeBoard 2006). The rising cost of a college education may be pushing many college students into the labor market to pay for their college education. The U.S. Bureau of Labor Statistics (April 2008) reports that a majority (53%) of all college students age 16-24 are employed during the academic term. While college costs are rising, BLS data indicate a shrinking labor market for college-age students during this period since the civilian labor force participation rate for 16-24 year olds dropped from 65.5% (1996) to 59.0% (2007).<sup>1</sup> The purpose of this paper is to examine how the various forms of financial assistance (federal need-based aid, merit scholarships, and parental assistance) affect the decisions by students to seek employment during the academic term.

We find that both the type of financial assistance and the overall level of assistance have significant impacts on student employment. Students who receive merit-based scholarships are much more likely to reduce their employment hours. We also find that an equivalent amount of parental assistance reduces college students' labor supply, but the impact of parental assistance

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<sup>1</sup> In addition, the BLS Current Employment Statistics ([www.bls.gov](http://www.bls.gov)) indicate that the average private weekly hours for all individuals worked dipped slightly from 34.1 hours (1996) to 33.8 (2007).

on hours worked is considerably smaller than the impact of merit-based scholarships. Finally, students who receive need-based financial assistance continue to work the same amount, which suggests that need-based assistance may not be adequately covering college expenses.

This paper is not the first to examine the effect of scholarships on student behavior. Previous research has documented that college enrollment decisions are sensitive to financial aid offers (Liu and van der Klaauw, 2007). Less well known are how the various forms of financial assistance influences study and employment decisions after a student enrolls in college. For example, Wolff (2006) and Kalenkoski and Pabilonia (2008) report that a reduction in parental support had no significant impact on student employment and suggest that students may be working to support a higher standard of living than in previous generations. Other researchers have examined the negative impact of college student employment on grades, academic progress, and college social life (e.g., DeSimone 2008; Kalenkoski and Pabilonia 2008; Stinebrickner and Stinebricker 2003; Watts and Pickering 2000; Ford and Bosworth 1995; Paul 1982).

We seek to gain a better understanding of how types of financial assistance impact the accumulation of academic human capital and work experience. Understanding the financial incentives created by merit- and need-based scholarships and how these forms of financial assistance encourage (or discourage) college employment and hours studying may yield insight into more effective public policies that can reduce the need for college student labor during the academic term and can enhance the development of human capital. Previous studies on college term employment have not included merit- and need-based assistance as a factor, instead focusing on the importance of the parents' education and income, student's age, gender, living arrangements, marital status, wage rate and number of dependents, parental transfers, college

tuition costs, and course difficulty (e.g, Kalenkoski and Pabilonia 2008; Oettinger 2006; Bailey 2003; and Demeulemeester and Rochat 2000).

This paper is organized as follows. Next we present the theoretical motivation followed by empirical model and methods. Then we turn to the survey data employed in the paper along with some details about the Georgia HOPE scholarship. Finally, we provide the estimation results and conclusion.

## II. Theoretical Motivation

The theoretical foundation for the empirical model follows Oettinger's (2006) two-period college and post-college model. As adapted for our study, the college student is assumed to choose a career path (i.e., a major) and a set of times devoted to work, leisure, and study to maximize utility as a function of consumption and leisure activities during college and potential income during the student's post-college life.

Potential income is determined by the level of human capital developed in college. Students with high grades and high income-potential majors (e.g., pre-law, engineering, and pre-medical) in college have a high level of human capital development and thus high post-college potential income. These high potential-income producing choices, however, require more study time during college.

College income and thus consumption is determined by employment income during college, need-based and merit-based transfers received from institutions, and monetary and in-kind transfers from parents. Although a decision to increase hours of employment increases college consumption, this decision reduces study time, thus forcing the college student to choose a major or academic performance level that reduces potential income.

Because merit-based scholarships require a higher standard of academic excellence than either need-based scholarship programs (typically require 2.0 college GPA) or Parental support, recipients of merit-based scholarships may need to allocate more time studying in order to maintain their higher academic standard. Hence merit scholars have an implied constraint on work hours to stay above the GPA threshold. Therefore the merit-based financial support programs may elicit a different employment response than those of non-merit based sources of college financial support.

### III. The Empirical Model and Methods

Why do students seek employment during the academic term? While students seek employment for a variety of different reasons, we group these reasons into one of two categories: (i) students need work for career development purposes (building human capital by gaining work experience in a related field); and (ii) students need income to pay for college expenses. Our student survey reveals that the overwhelming majority of students choose to work during the fall academic term primarily for “income to support yourself/household” (91%); while a small fraction (just 9%) work for “career/educational training program”. An increase in financial support should have a minimal effect on labor hours of students who are working during the academic term in career-developing (e.g., internships, Cooperative Education) or actual career-employment. In contrast, increased financial support should have a significant impact on academic-term labor hours of students who are employed solely to pay for college costs. Because part-time students may already be pursuing their career employment, the analysis is undertaken separately for part-time and full-time students.

Table 2 reveals that the primary source of financial assistance for full-time students at Valdosta State University (a public regional university in Georgia) comes from parents (averaging \$1,984), followed by federal need-based assistance (averaging \$1,720) and then the merit-based HOPE (“Helping Outstanding Pupils Educationally”) scholarship (averaging \$1,579). All of these financial assistance amounts are lower for part-time students. Comparing the total financial support for HOPE and non-HOPE students reveals that HOPE scholars (averaging \$5,603) have a considerably larger total amount of financial support each semester than non-HOPE recipients (averaging \$3,504). While the HOPE scholarship contributes to the bulk of this \$2,100 funding gap, we also note that Parental support is larger for HOPE students (averaging \$2,041) than for non-HOPE students (averaging \$1,632). Given that HOPE students have both HOPE financial support and higher Parental support than non-HOPE scholars, non-HOPE recipients have greater financial need and hence larger levels of federal assistance (averaging \$1,872) than HOPE scholars (averaging \$1,697).

Given that the data relates to a particular semester, many of the student’s decisions (e.g., major, credit hour load, and amount of transfers from particular sources) are predetermined. To address the issue of the potential endogeneity of Parental support on the student’s decision to enter the workforce, we perform a Hausman test using an augmented regression. The Hausman test results reject the hypothesis that Parental support is an endogenous variable.<sup>2</sup> Therefore, the student’s primary decision variable for a particular semester is how to allocate time among employment, leisure, and study. Similar to Oettinger (2006), we excluded wage rates and tuition

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<sup>2</sup> Specifically, we estimate a Tobit with Parental support as the dependent variable and the same explanatory X variables from equation (1) with the following additions: male parent education (years) and siblings currently in college. We save the error term from this estimation and use it to estimate a Tobit for hours worked as specified in equation (1). The insignificant error term from this estimation suggests that Parental support is not endogenous to student work hours.

from the empirical model due to a lack of variation in these variables at the same local college-employment market and university.

The dependent variable in our analysis (student employment) has a large number of observations that equal 0. Because students cannot work less than 0 hours, the dependent variable is censored at zero. Tobit estimation is an appropriate technique for analyzing dependent variables that cannot be observed below a lower limit (Tobin 1958) and hence this technique is used to examine student employment hours.<sup>3</sup> We note that ordinary least squares (OLS) is inappropriate in this case because it produces biased coefficient estimates if applied to a censored dependent variable. Consistent estimates are obtained by the maximum likelihood estimation of the following Tobit model:

$$Y_i^* = \beta'X + \varepsilon_i \quad (1)$$

$$Y_i = 0 \text{ if } Y_i^* \leq 0 \quad (2)$$

$$Y_i = Y_i^* \text{ if } Y_i^* > 0 \quad (3)$$

The dependent variable  $Y_i^*$  is a latent variable and  $Y_i$ , its observed counterpart, represents the number of hours per week the  $i^{\text{th}}$  student was engaged in paid employment during the Fall semester 2004.  $X$  is a vector of financial assistance, student characteristics, and parental attributes.  $\beta$  is a vector of parameters that will be estimated, and  $\varepsilon$  is the normally and independently distributed error term. We report the following marginal effects for the observed  $Y$  (McDonald and Moffitt, 1980):

$$\partial E(Y)/\partial X_j = F(z)\beta_j \quad (4)$$

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<sup>3</sup> We also considered a two-step Heckman (1976) model in which we first estimated the effect on employment (binary) and then estimated the effect on hours worked for those who are employed. While similar results were found using the Heckit method, because of censoring concerns we opted to use the Tobit estimation.

where  $z = \beta'X_i/\sigma$ , with  $\sigma$  representing the standard error of the error term and  $F$  is the cumulative density function. Therefore, our reported marginal effect is “unconditional” because it represents all students (the observed value of  $Y_i$  can be zero or positive), not just those students who are employed.

#### IV. Data and HOPE Scholarship

The data used in this study come from a survey entitled “The Impact of Financial Support on College Student Behavior.” The survey was conducted in the spring semester of 2005 at Valdosta State University.<sup>4</sup> College students were asked to respond to a variety of questions covering: demographic information; high school performance (e.g., high school grade point average, SAT or ACT scores) and employment; parental income, influence, support, and occupation; college academic data (e.g., credit hours completed, grade point average, and major) and employment (e.g., hourly earnings and hours worked); and financial support from parents along with need based and merit-based scholarships.

This study examines the labor supply decisions of 247 part-time and 1,242 full-time students who completed the survey.<sup>5</sup> Descriptive statistics appear in Table 1. All survey questions were retrospective (i.e., pertaining to the recently completed Fall Semester 2004). Our sample population of college students is well distributed by gender, race, age, SAT scores, and choice of major. Slightly more than half the sample is female (53%). Three-fourths of the students in the sample are white, and 20% are black. The sample is divided nearly in half between 18-20 year olds (54%) and 21-25 year olds (45%). The SAT score distribution is as follows: 800-1010 (43%), 1011-1200 (40%) and 1201+ (14%). The surveyed students have a

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<sup>4</sup> Oettinger (2006) uses a similar data base from a survey at University of Texas at Austin.

<sup>5</sup> The survey completion rate was 88.1% (of the 1,489 distributed surveys - 1,312 were fully completed).



wide variety of majors, with Business and Economics (33%), Education and Psychology (18%), and Math and Science (17%) as some of the more popular majors.

In addition, approximately 60% of students in the sample were employed in the fall semester of 2004. The mean hourly student wage is \$8.07. A slight majority of parents (51%) were in favor of their child working while attending classes. Most college students in our sample (71%) also worked while in high school.

Approximately 58% of students in the sample were receiving the HOPE scholarship. For full-time students (taking 12+ credit hours), the HOPE support is worth approximately \$1,800 in paid tuition and fees and book allowance per semester. The mean financial support from family members was \$2,004; and the mean financial support from Federal, State, and other non-family members was slightly less at \$1,718.

Since its inception in 1993, the State of Georgia's HOPE scholarship has allocated over \$4.0 billion in merit-based scholarships to over 1.1 million Georgia students.<sup>6</sup> The federal HOPE tuition tax credit is modeled after Georgia's educational scholarship program. Approximately twenty other states now offer a similar merit-based scholarship program.

The Georgia HOPE scholarship requires a 3.0 (out of 4.0) high school GPA on a set of core courses to qualify. To retain the scholarship the student must maintain a 3.0 college GPA. For Georgia residents enrolling in either public or private universities in Georgia, HOPE pays course tuition and fees along with a fixed book allowance each semester for a maximum of 127 college credit hours.<sup>7</sup> The amount of the scholarship reflects the number of enrolled credit hours. The HOPE scholarship is available for both full-time and part-time students.

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<sup>6</sup> For more details on HOPE see Cornwell and Mustard (2005) and Cornwell, Mustard and Sridhar (2006).

<sup>7</sup> Three components determine the merit aid for a HOPE recipient: tuition is the largest component (this increases with credit hours and reaches a maximum at 12 credit hours), fees (either low fee reimbursement for students taking

Previous research on the HOPE scholarship has focused on its enrollment impact, enrollment of minorities, and type of college selected (Cornwell, Mustard and Sridhar 2006; Dynarski 2000, 2003). The HOPE scholarship has been analyzed for its effect on student quality, hours enrolled, course withdrawals, and summer credits by Cornwell, Lee and Mustard (2005); on state appropriations, student tuition and fee charges, and institutional scholarships by Long (2004); and, on high school educational quality by Henry and Rubenstein (2002). More generally, Avery and Hoxby (2004) find that more generous financial aid packages (merit, need, and work-study) help to attract high ability students. A recent field experiment by Monks (2009) reveals that merit aid awards attract more high qualified students.

Previous studies of HOPE, however, suggest that students react to the merit requirements by reducing the time demands of their academic programs through taking fewer classes each term, taking easier classes, and withdrawing if grade problems develop (Cornwell, Lee and Mustard 2005). While our data cannot address the concerns about easy classes and withdraws, our evidence indicates that HOPE students take an average of 12.6 credit hours compared to only 11.1 hours for non-HOPE students. A large part of this credit-hour difference, however, is attributed to part-time non-HOPE students. Once part-time students are removed, the credit-hour difference shrinks; however, full-time HOPE students still enroll in slightly more credit hours 13.4 compared to 13.0 hours than full-time non-HOPE students. Therefore, in contrast to Cornwell, Lee and Mustard (2005) we find no evidence in our survey data that suggests HOPE students reduce their academic loads to produce higher level of academic success.

The provision in HOPE allowing students to receive aid for less than full-time enrollment reduces the penalty on students who wish to substitute employment hours for class hours. In

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3 hours or less, or a high fee reimbursement for students taking 4+ credit hours), and books (all students receive the same stipend).

addition, as suggested by Cornwell and Mustard (2007), because of the high positive correlation between academic success and family income, HOPE scholars may not feel the need to work even without HOPE support. Therefore, receiving a HOPE scholarship may have little effect on employment decisions of HOPE scholars.

In summary, the HOPE scholarship and merit-based scholarships in general may not have the negative effect on employment of HOPE-qualified students as suggested by a simple application of economic theory. The purpose of this study is to quantify the impact of both the merit-based and non-merit based scholarships and Parental support on college students' employment and academic decisions during the class term.

## V. Empirical Results

In addition to a combined analysis, we separately examine the labor supply decisions of part-time (less than 12 credit hours) and full-time students (12 or more credit hours) because these groups likely have different labor supply characteristics. For example, part-time students may be working a full-time career job, hence preventing them from attending school full-time. Table 1 reveals that part-time students are more likely to be in the work force (71%) compared to full-time students (58% work). In addition, the typical part-time student works 19 hours each week compared to just 12 hours working each week by the typical full-time student. Therefore, part-time students are more active in the labor force. Finally, full-time students have higher college GPA's (3.12) compared to part-timers (2.68). In terms of financial assistance, Table 2 reveals that full-time and part-time students are similar for both federal and parental assistance. The largest financial difference involves merit-scholarships, as full-time students collect an

average of \$1800 in HOPE assistance compared to less than \$500 in HOPE assistance for part-time students.

Tobit estimation results appear in Table 3. We present estimations for the entire sample followed by separate estimates for full-time (12 or more credit hours) and part-time (less than 12 credit hours) students. Given that five-sixths of the sample participants are full-time students, finding very similar estimation results using either all students or only full-time students is not surprising. The analysis of the results is broken into three categories: financial assistance, student characteristics, and parental attributes.

#### A. Financial Assistance

Figure 1 shows a negative relationship between financial assistance and hours of employment. Students with the lowest (highest) levels of financial aid typically work more (fewer) hours. While no discernable link is evident between federal assistance and hours worked, we find a negative relationship between parental assistance and hours worked. When parents provide \$2,000+ in financial aid, the amount of hours worked varies between 0 and 13 hours. For parents providing less than \$2,000 in aid during the fall term, the amount of weekly hours worked typically ranges between 18 and 35 hours.

Financial aid is supposed to allow students to reallocate time from market work to non-market work (i.e., studying). Support for this claim is provided by Figure 2 that depicts the relationship between financial aid and hours studying. This figure shows that lower levels of financial aid are associated with fewer hours of studying, while students that receive the largest financial aid packages are spending the greatest amount of time studying. The behavior of HOPE scholars working less (and studying more) is consistent with DeSimone (2008) who reports

lower GPAs for students with heavier work loads. This reallocation of time from working to studying by HOPE recipients may increase knowledge and skill in the chosen field of study; however, the cost of additional time spent studying is less time allocated to developing human capital through work experience. This cost seems minimal, at least for the students in our sample, given that less than 10 percent of students surveyed are working for career and skill development.

More formally, Table 3 presents Tobit estimates of the relative impact of various forms of financial support on the labor supply decision and human capital acquisition. The marginal effects reported in Table 3 are the “unconditional expectation,” which we interpret as follows: the -1.29 marginal effect for Parental support for the All Students sample indicates that a \$1,000 increase in Parental support reduces the number of hours worked by 1.29 each week during the academic term. A similar reduction in hours worked (1.143) is reported for the sample of Full-Time Students who receive Parental support. For Part-Time Students, the marginal effect (2.209 hour reduction) is even stronger. For all three samples, Parental support enables students to work less. Interestingly, working less does not necessarily translate into studying more. In Table 5, Parental support is positively (yet insignificantly) correlated with an increase in hours studying. We do, however, find total financial assistance (parental + federal + HOPE assistance) is positively and significantly associated with increased hours studying (see Table 5).

Turning to HOPE support, the marginal effects for the All Students sample suggest a 1.31 hour reduction in weekly work hours following a \$1,000 increase in HOPE support. Following a \$1,000 increase in the HOPE scholarship, this marginal effect reduces hours worked by 2.49 hours for the Full-Time Student and reduces hours worked by 3.13 for the Part-Time Student.

The reduction in employment hours for full-time HOPE students (2.49 hours reduction) is twice as large per \$1000 dollar increase as for Parental support (1.14 hours reduction).

Finally, Table 3 reveals that for both the All Student and Full-Time Student samples no link between of Federal support and employment hours during the academic term. For part-time students, however, the effect of Federal support is noticeable since it reduces student employment hours by 1.6 hours per \$1,000 of federal aid.

Therefore, of the three forms of aid, HOPE dollars create the largest reduction in the number of labor hours. These findings are robust to the student status as we find similar results for both full-time and part-time students.

Our finding that students receiving merit-based aid are reallocating time away from market work toward non-market work (i.e., to academic human capital accumulation from studying) implies that HOPE scholarships are providing students with enough income to reduce hours in employment that does not provide human capital development. Support for this claim comes from the fact that our student survey reveals that the proportion of students working for income reasons is smaller for HOPE students (89.7%) than for non-HOPE students (93.5%). A Wilcoxon rank-sum test suggests that this difference is marginally significant ( $z = 1.95$ ,  $p\text{-value} = 0.051$ ).

Students face a trade-off between working more today to increase current income or studying more today to generate more human capital development and thus higher future income. We find that financial assistance is a key component in both of the work and study decisions. Students with more financial support from their parents and from merit scholarships work significantly fewer hours. In addition to working less, students who receive more total financial support also spend modestly more time studying each week (see Table 5). While recipients of

Federal support has only a negligible effect on employment hours, we find significantly more weekly study hours for students receiving higher levels of Federal support. Table 5 suggests that students study 0.4 hours more each week if they receive \$1,000 more in Federal support.

#### B. HOPE and Non-HOPE Recipients

Given that HOPE recipients are working fewer hours than non-HOPE recipients, we present in Table 4 the results from separate Tobits for students who receive and for student do not receive the HOPE merit scholarship. We find that financial assistance from parents has a 45% larger impact on HOPE than non-HOPE students' work hours. Specifically, the marginal effects suggest a \$1,000 increase in Parental support reduces hours worked by 1.7 and 1.1 hours for HOPE and non-HOPE scholars, respectively. This difference suggests that the combination of the HOPE merit scholarship with parental assistance provides a sufficient amount of income such that HOPE recipients can reduce their work hours and/or exit the labor market. Therefore, HOPE scholars during the academic term are significantly less likely to enter the labor force (55.1%) compared to non-HOPE students (61.6%).

While Parental support clearly reduces student employment, we find no effect of Federal support on student work decisions for both HOPE and non-HOPE recipients. Therefore, since students who receive federal assistance are not reducing their employment hours, need-based Federal support does not adequately cover college costs.

Enrolling in more credit hours is negatively correlated with more student employment hours for both HOPE and non-HOPE recipients. However, an additional course credit hour has a larger effect on HOPE recipients (0.8 hours reduction in employment hours) than on non-HOPE students (0.4 hours reduction in employment hours). The larger reduction in employment by

HOPE scholars is likely due to the requirement that HOPE scholars maintain at least a 3.0 GPA to retain their merit scholarship. In fact, we find that HOPE scholars study an average of 8.1 hours per week compared to just 6.2 hours studying for non-HOPE recipients. A Wilcoxon rank-sum test easily rejects the hypothesis that these two groups have an equivalent amount of hours studying ( $z = -6.16$ ,  $p\text{-value} = 0.000$ ). Our findings that HOPE scholars study more is consistent with Stinebrickner and Stinebrickner (2008) who report better academic performance for students who spend more time studying. While Table 5 reveals that HOPE has a marginally significant negative effect on study hours, this effect is negated by the large positive coefficient for credit hours enrolled (since the HOPE scholarship increases with credit hours enrolled).<sup>8</sup>

Not only do we find that HOPE scholars study more, but we also find a link between hours studying and financial aid. Figure 2 shows a positive relationship between total financial aid and hours studying. While these results for merit-based aid are expected, more surprising was that both parental aid and federal aid are also positively correlated with hours studying. In fact, a simple correlation between hours studying and the four measures of financial aid are all positive: parental aid (0.035), HOPE (0.124), federal aid (0.129), and total financial aid (0.127).

### C. Student Characteristics

Two student characteristics that significantly increase the likelihood of working are vehicle ownership and credit-hours enrolled. Not surprisingly, students with vehicles work significantly more hours during the academic term. Table 3 reveals that full-time students who are enrolled in more credit hours work significantly fewer hours, i.e., a full-time student who takes an additional credit hour above the mean (12 hours) works about 0.65 hours less each

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<sup>8</sup> For example, a HOPE scholar who moves from part-time (6 credit hours) to full-time status (12 credit hours) increases their HOPE scholarship by \$548. The effect on weekly study hours is +2.69 (credit hours enrolled effect:  $6*0.448$ ) – 0.33 (HOPE scholarship effect:  $0.548*-0.603$ ) = 2.36 additional hours studying.



week. Part-time students, however, work approximately 0.8 hours more per week for each additional credit hour. Full-time students who want to maintain good grades appear to be reducing their supply of labor when taking heavier course loads. On the other hand, part-time students seem to need to increase their work hours as their credit hour load rises, possibly to pay for the additional credit hours.

#### D. Parental Attributes

While most parental characteristics (i.e., children in parental household, female parent years of education, male parent occupation, and parental income) have no effect on the student's work-hours decision, we do find that parental preferences toward work have a large influence on the full-time student's decision to supply labor during the semester. The marginal effects from Table 3 suggest that full-time students work an average of 3.5 more hours each week when their parents are in favor (instead of opposed) to them working during the academic term.

Interestingly, parental influence appears limited to only full-time students. Parental preferences have only modest and insignificant effects on the decision to work by part-time students.

We also find that parents who favor working while in school has a significant and positive employment effect on both HOPE and non-HOPE students (see Table 4). The magnitude of the employment effect, however, is not equivalent – parents who favor work by HOPE recipients increase hours worked by 4.5 hours compared to just 2.2 hours for non-HOPE students. Finally, we observe somewhat surprisingly, more employment hours for HOPE recipients whose male parent occupation is educationally intensive (i.e., medicine, engineer, academic careers, etc.). We find no link between male parent occupation and non-HOPE student employment hours.

## VI. Conclusion

Rising college tuition costs may be forcing many students to seek employment during the academic term. This study employs a unique data set - a survey of financial support and employment decisions of Valdosta State University students in 2005 - to examine how the various forms of financial assistance (federal need-based aid, merit scholarships, and parental assistance) affect college student employment and academic decisions. College students work while enrolled in school for primarily for income reasons and secondarily for career development purposes. Financial assistance reduces the need for students to work solely for income.

Our research suggests that type of financial assistance and level of assistance both have significant impacts on student employment. Students who receive merit-based scholarships, like the Georgia HOPE scholarship, are more likely to reduce employment hours. Parental assistance also reduces college students' labor supply; however, its impact on reducing hours worked is considerably smaller than merit-based scholarships. On the other hand, students who receive need-based financial assistance are not reducing their hours of employment. This finding suggests that need-based federal financial assistance may not adequately cover college expenses.

We find a positive externality associated with increased financial assistance: students who receive more federal financial assistance spend significantly more time studying. We find that HOPE scholarship recipients during the academic term on average work less and study more (about two more hours each week than non-HOPE recipients). Merit scholarships not only reward talented students, but they also allow students the freedom of pursuing career/academic development without the financial pressures of being required to work to pay college expenses.

More generally, students who receive larger amounts of total financial assistance work less and study more compared to students with smaller levels of financial assistance. Given that a primary reason for subsidizing individual education is the positive externality to society created by individuals with human capital, one way that public policy makers could encourage more non-market work (i.e., studying) is provide enough financial assistance such that students could voluntarily opt not to work during the academic term.

## References

- Avery, Christopher and Caroline Hoxby (2006). "Do and Should Financial Aid Affect Students' College Choices." In C. Hoxby (Ed.), *College Choices*. Chicago, IL: University of Chicago Press.
- Bailey, Mark (2003) "The Labour Market Participation of Northern Ireland University Students." *Applied Economics*, 35, 1345-50.
- Cornwell, Christopher and David Mustard (2007). "Merit-Based College Scholarships and Car Sales." *Education Finance and Policy*, 2, 133-51. University of Georgia Working Paper.
- Cornwell, Christopher, Lee, Kyung, and David Mustard (2005). "Student Responses to Merit Scholarship Retention Rules." *Journal of Human Resources*, 40(4), 895-917.
- Cornwell, Christopher, Mustard, David B. and Deepa J. Sridhar (2006) "The Enrollment Effects of Merit-Based Financial Aid: Evidence from Georgia's HOPE Program." *Journal of Labor Economics*, 24, 761-86.
- Demeulemeester, Jean-Luc and Denis Rochat (2000) "Labour Participation of Higher Education Students." *Labour*, 14 #3, 503-22.

- DeSimone, Jeffrey S. (2008). "The Impact of Employment during School on College Student Academic Performance." NBER Working Paper #14006.
- Dynarski, Susan M. (2000) "HOPE for Whom? Financial Aid for the Middle Class and its Impact on College Attendance." *National Tax Journal*, 53, 629-61.
- Dynarski, Susan M. (2003) "Does Aid Matter? Measuring the Effect of Student Aid on College Attendance and Completion." *American Economic Review*, 93, 279-88.
- Ford, J., Bosworth, D. and R. Wilson (1995) "Part-time Work and Full-time Higher Education." *Studies in Higher Education*, 20(2), 187-203.
- Heckman, James J. (1976). "The Common Structure of Statistical Methods of Truncation, Sample Selection, and Limited Dependent Variables and a Simple Estimator for Such Models." *Annals of Economic and Social Measurement* 5, 475-92.
- Henry, Gary T. and Ross Rubenstein (2002) "Paying for Grades: Impact of Merit-Based Financial Aid on Educational Quality." *Journal of Policy Analysis and Management*, 21(1), 93-109.
- Kalenkoski, Charlene and Sabrina Pabilonia (2008) "Parental Transfers, Student Achievement, and the Labor Supply of College Students." BLS Working Paper 401, 1-38.
- Liu, Haiyong and Wilbert van der Klaauw (2007) "The Impact of Financial Aid Offers on College Going Behavior." East Carolina University Dept. of Economics working paper.
- Long, Bridget Terry (2004). "How do Financial Aid Policies Affect Colleges? The Institutional Impact of the Georgia HOPE Scholarship." *Journal of Human Resources*, 39(4), 1045-66.
- McDonald, John F. and Robert A. Moffitt (1980). "The Uses of Tobit." *Review of Economics and Statistics*, 62(2), 318-21.

- Monks, James (2009). "The Impact of Merit-based Financial Aid on College Enrollment: A Field Experiment." *Economics of Education Review*, 28, 99-106.
- Oettinger, Gerald S. (2006) "Parents' Financial Support, Students' Time Use, and Academic Performance in College." University of Texas Dept. of Economics working paper.
- Paul, Harvey (1982) "The Impact of Outside Employment on Student Achievement in Macroeconomic Principles." *The Journal of Economic Education*, 13 (summer), 51-56.
- Pollak, Robert A. (1988) Tied Transfers and Paternalistic Preferences." *The American Economic Review*, 78 #2 (May) 240-44.
- Stinebrickner, Ralph and Todd Stinebrickner (2003) "Working during School and Academic Performance." *Journal of Labor Economics*, 21 #2, 473-91.
- Stinebrickner, Ralph and Todd Stinebrickner (2008) "The Casual Effect of Studying on Academic Performance." *The B.E. Journal of Economic Analysis & Policy*, Vol. 8: Iss. 1 (Frontiers), Article 14.
- Tobin, James (1958). "Estimation of Relationships for Limited Dependent Variables." *Econometrica*, 26, p. 24-36.
- Watts, Catherine and Angela Pickering (2000) "Pay as you Learn: Student Employment and Academic Progress." *Education and Training*, 42 # 2/3, 129-35.
- Wolff, Francois-Charles (2006) "Parental Transfers and the Labor Supply of Children." *Journal of Population Economics*, 19, 853-77.

TABLE 1: Full-time student characteristics

| Variable                            | Observations | Mean   | S. D. | Min  | Max  |
|-------------------------------------|--------------|--------|-------|------|------|
| CH (credit hours enrolled Fall '04) | 1207         | 13.24  | 2.07  | 12   | 18   |
| HOURS WORKED                        | 1242         | 11.71  | 12.36 | 0    | 35   |
| PAIDEMP                             | 1201         | .58    | .49   | 0    | 1    |
| MALE                                | 1234         | .461   | .439  | 0    | 1    |
| WHITE                               | 1242         | .726   | .446  | 0    | 1    |
| BLACK                               | 1242         | .216   | .412  | 0    | 1    |
| EXPER (High School Work)            | 1242         | .692   | .462  | 0    | 1    |
| HSGPA (High School GPA)             | 1242         | 3.41   | .413  | 1.9  | 3.75 |
| GPA (College GPA Fall '04)          | 1208         | 3.12   | .555  | 1.5  | 3.75 |
| AGE                                 | 1234         | 21.6   | 3.41  | 17   | 33   |
| SAT                                 | 1186         | 1034.6 | 161.5 | 650  | 1500 |
| FAVORWORK                           | 1242         | .505   | .500  | 0    | 1    |
| FEMALE PARENT EDUC (years)          | 1242         | 14.40  | 2.84  | 8    | 20   |
| MALE PARENT EDUC (years)            | 1242         | 14.64  | 3.26  | 8    | 20   |
| INCOME PARENT (in \$1000s)          | 1242         | 84.51  | 52.30 | 10   | 250  |
| HOPESUPPORT (in \$1000s)            | 1242         | 1.80   | .439  | 0    | 1.90 |
| PARENTSUPPORT (in \$1000s)          | 1195         | 2.02   | 2.10  | .025 | 7.50 |
| FEDERALSUPPORT (in \$1000s)         | 1168         | 1.76   | 1.94  | .025 | 7.50 |
| CHILDREN (in Parental Household)    | 1230         | 2.42   | .922  | 1    | 4    |
| CHILDREN ages 0 – 4 (own house)     | 1242         | .043   | .202  | 0    | 1    |
| CHILDREN ages 5 – 14 (own house)    | 1242         | .038   | .191  | 0    | 1    |
| CAR_OWN                             | 1211         | .887   | .316  | 0    | 1    |
| DEGREE (high income potential)      | 1242         | .149   | .356  | 0    | 1    |

## Part-time student characteristics

|                                     |     |        |       |      |      |
|-------------------------------------|-----|--------|-------|------|------|
| CH (credit hours enrolled Fall '04) | 247 | 5.83   | 2.49  | 1    | 8    |
| HOURS WORKED                        | 247 | 19.13  | 14.49 | 0    | 35   |
| PAIDEMP                             | 244 | .713   | .453  | 0    | 1    |
| MALE                                | 246 | .496   | .501  | 0    | 1    |
| WHITE                               | 247 | .761   | .427  | 0    | 1    |
| BLACK                               | 247 | .178   | .383  | 0    | 1    |
| EXPER (High School Work)            | 247 | .753   | .432  | 0    | 1    |
| HSGPA (High School GPA)             | 246 | 3.39   | .432  | 2.25 | 3.75 |
| GPA (College GPA Fall '04)          | 239 | 2.68   | .737  | 1.5  | 3.75 |
| AGE                                 | 246 | 22.5   | 4.13  | 17   | 33   |
| SAT                                 | 236 | 1022.4 | 154.4 | 650  | 1300 |
| FAVORWORK                           | 247 | .551   | .498  | 0    | 1    |
| FEMALE PARENT EDUC (years)          | 247 | 14.17  | 2.93  | 8    | 20   |
| MALE PARENT EDUC (years)            | 247 | 14.64  | 3.39  | 8    | 20   |
| INCOME PARENT (in \$1000s)          | 247 | 80.36  | 53.70 | 10   | 250  |
| HOPESUPPORT (in \$1000s)            | 247 | .486   | .711  | 0    | 1.64 |
| PARENTSUPPORT (in \$1000s)          | 242 | 1.80   | 2.17  | .025 | 7.50 |
| FEDERALSUPPORT (in \$1000s)         | 240 | 1.51   | 1.88  | .025 | 7.50 |
| CHILDREN (in Parental Household)    | 246 | 2.30   | .939  | 1    | 4    |
| CHILDREN ages 0 – 4 (own house)     | 247 | .052   | .224  | 0    | 1    |
| CHILDREN ages 5 – 14 (own house)    | 247 | .056   | .232  | 0    | 1    |
| CAR_OWN                             | 244 | .963   | .189  | 0    | 1    |
| DEGREE (high income potential)      | 247 | .150   | .358  | 0    | 1    |

Table 2: Student Survey of Financial Assistance (in \$1,000) in Fall 2004

|                     | n    | Federal | HOPE  | Parent | Total |
|---------------------|------|---------|-------|--------|-------|
| All students        | 1489 | 1.720   | 1.579 | 1.984  | 5.283 |
| Full-time           | 1242 | 1.764   | 1.797 | 2.021  | 5.582 |
| Part-time           | 247  | 1.506   | 0.486 | 1.801  | 3.793 |
| HOPE recipient      | 1261 | 1.697   | 1.865 | 2.041  | 5.603 |
| No-HOPE scholarship | 228  | 1.872   | 0     | 1.632  | 3.504 |

Table 3: Tobit Estimation: Weekly hours of student employment during Fall semester 2004

| Sample   | All students |           |           | Full-time students |           |           | Part-time students |           |           |
|--|--------------|-----------|-----------|--------------------|-----------|-----------|--------------------|-----------|-----------|
|  | Coeff        | Std Error | Marg. Eff | Coeff              | Std Error | Marg. Eff | Coeff              | Std Error | Marg. Eff |
| <b>Financial Assistance</b>  |              |           |           |                    |           |           |                    |           |           |
| Parents support (in \$1000s)   | -1.926 **    | 0.266     | -1.290    | -1.801 **          | 0.294     | -1.143    | -2.614 **          | 0.608     | -2.209    |
| Federal support (in \$1000s)   | -0.130       | 0.283     | -0.087    | 0.179              | 0.310     | 0.113     | -1.906 **          | 0.665     | -1.611    |
| HOPE support (in \$1000s)  | -1.956 ^     | 1.011     | -1.310    | -3.923 ^           | 2.064     | -2.489    | -3.699 ^           | 2.011     | -3.126    |
| <b>Student Characteristics</b>   |              |           |           |                    |           |           |                    |           |           |
| Age  | 0.161        | 0.199     | 0.108     | -0.031             | 0.227     | -0.020    | 0.741 ^            | 0.385     | 0.626     |
| Experience   | 1.507        | 1.215     | 1.000     | 1.532              | 1.323     | 0.962     | -2.149             | 2.953     | -1.833    |
| White  | 0.029        | 2.558     | 0.019     | -0.308             | 2.880     | -0.196    | -0.516             | 5.110     | -0.437    |
| Black  | 0.859        | 2.734     | 0.580     | -0.568             | 3.062     | -0.358    | 3.957              | 5.803     | 3.414     |
| Male   | 0.256        | 1.138     | 0.172     | 0.155              | 1.258     | 0.098     | -0.082             | 2.586     | -0.069    |
| SAT  | -0.002       | 0.004     | -0.001    | -0.006             | 0.004     | -0.004    | 0.018 *            | 0.008     | 0.016     |
| High School GPA  | 0.667        | 0.729     | 0.446     | 1.061              | 0.821     | 0.673     | -1.612             | 1.508     | -1.363    |
| Car owner  | 15.344 **    | 2.051     | 8.269     | 15.054 **          | 2.122     | 7.648     | 19.769 *           | 8.098     | 13.166    |
| Children ages 0 - 4  | 0.373        | 2.993     | 0.251     | 2.573              | 3.306     | 1.696     | -10.375            | 6.661     | -7.915    |
| Children ages 5 - 14   | 0.694        | 3.733     | 0.469     | 2.255              | 4.247     | 1.480     | -4.740             | 7.392     | -3.842    |
| Degree (high income potential)   | 0.028        | 1.483     | 0.019     | 0.349              | 1.623     | 0.222     | -2.968             | 3.496     | -2.463    |
| Credit hours (enrolled Fall '04)   | -0.627 **    | 0.197     | -0.420    | -1.022 **          | 0.320     | -0.648    | 0.951 ^            | 0.558     | 0.804     |
| College GPA (Fall '04 semester)  | -1.176       | 0.958     | -0.788    | -2.387 *           | 1.112     | -1.514    | 2.660              | 1.834     | 2.248     |
| <b>Parental Attributes</b>   |              |           |           |                    |           |           |                    |           |           |
| Children (in parental household)   | 0.145        | 0.596     | 0.097     | 0.683              | 0.656     | 0.433     | -1.700             | 1.327     | -1.437    |
| Female parent education (years)  | -0.069       | 0.205     | -0.046    | -0.056             | 0.227     | -0.036    | -0.010             | 0.436     | -0.009    |
| Male parent occupation   | 0.462        | 0.387     | 0.310     | 0.654              | 0.426     | 0.415     | -0.357             | 0.881     | -0.302    |
| Favor work (parents)   | 5.263 **     | 1.100     | 3.516     | 6.088 **           | 1.212     | 3.858     | 2.357              | 2.445     | 1.987     |
| Income parent (in \$1000s)   | -0.002       | 0.010     | -0.001    | -0.004             | 0.011     | -0.002    | -0.027             | 0.026     | -0.023    |
| Constant   | 4.558        | 8.085     |           | 21.506 *           | 10.838    |           | -26.590            | 18.360    |           |
| Log likelihood   | -3821.8      |           |           | -3075.6            |           |           | -720.5             |           |           |
| F test joint equivalence of Full-<br>and Part-time students <sup>1</sup> | 2.06 **      |           |           |                    |           |           |                    |           |           |
| Pseudo R <sup>2</sup>  | 0.03         |           |           | 0.02               |           |           | 0.04               |           |           |
| Observations   | 1,312        |           |           | 1,094              |           |           | 218                |           |           |

Note: Marginal effects are the unconditional expected value:  $E(y|x)$ . ^, \*, and \*\* indicate 10%, 5%, and 1% significance levels, respectively.

<sup>1</sup> The F test clearly rejects the joint hypothesis that the above twenty-one coefficients for full-time and part-time students are equivalent.



Table 4: Tobit Estimation: Weekly hours of student employment for Hope and non-Hope recipients during Fall semester 2004

| Sample  | Hope recipients |           |           | Non-Hope students |           |           |
|---|-----------------|-----------|-----------|-------------------|-----------|-----------|
|   | Coeff           | Std Error | Marg. Eff | Coeff             | Std Error | Marg. Eff |
| <b>Financial Assistance</b>   |                 |           |           |                   |           |           |
| Parents support (in \$1000s)  | -2.572 **       | 0.368     | -1.660    | -1.635 **         | 0.408     | -1.143    |
| Federal support (in \$1000s)  | -0.380          | 0.404     | -0.245    | -0.018            | 0.415     | -0.013    |
| <b>Student Characteristics</b>  |                 |           |           |                   |           |           |
| Age   | 0.382           | 0.264     | 0.247     | -0.238            | 0.315     | -0.166    |
| Experience  | 0.775           | 1.537     | 0.498     | 1.662             | 2.017     | 1.150     |
| White   | 0.656           | 3.303     | 0.422     | -1.633            | 4.187     | -1.155    |
| Black   | 2.363           | 3.506     | 1.557     | -1.221            | 4.508     | -0.844    |
| Male  | -2.001          | 1.454     | -1.290    | 3.390 ^           | 1.858     | 2.375     |
| SAT   | 0.001           | 0.005     | 0.001     | -0.009            | 0.006     | -0.006    |
| High School GPA   | 0.191           | 0.930     | 0.123     | 1.980 ^           | 1.192     | 1.384     |
| Car owner   | 14.571 **       | 2.540     | 7.532     | 17.034 **         | 3.466     | 9.507     |
| Children ages 0 - 4   | 2.047           | 3.862     | 1.362     | -2.228            | 5.045     | -1.515    |
| Children ages 5 - 14  | -5.897          | 4.684     | -3.443    | 10.303            | 6.550     | 8.040     |
| Degree (high income potential)  | 0.057           | 1.816     | 0.037     | 0.909             | 2.696     | 0.642     |
| Credit hours (enrolled Fall '04)  | -1.213 **       | 0.238     | -0.783    | -0.516 *          | 0.249     | -0.361    |
| College GPA (Fall '04 semester)   | -0.602          | 1.347     | -0.389    | -0.986            | 1.511     | -0.689    |
| <b>Parental Attributes</b>  |                 |           |           |                   |           |           |
| Children (in parental household)  | -0.088          | 0.761     | -0.057    | 0.188             | 0.957     | 0.132     |
| Female parent education (years)   | -0.237          | 0.263     | -0.153    | 0.206             | 0.327     | 0.144     |
| Male parent occupation  | 1.174 *         | 0.498     | 0.758     | -0.362            | 0.615     | -0.253    |
| Favor work (parents)  | 6.987 **        | 1.430     | 4.498     | 3.180 ^           | 1.756     | 2.219     |
| Income parent (in \$1000s)  | 0.010           | 0.013     | 0.006     | -0.021            | 0.016     | -0.015    |
| Constant  | 3.810           | 11.052    |           | 7.534             | 12.280    |           |
| Log likelihood  | -2120.2         |           |           | -1664.7           |           |           |
| F test joint equivalence of Hope-<br>and non-Hope students <sup>1</sup> | 1.71 *          |           |           |                   |           |           |
| Pseudo R <sup>2</sup>   | 0.03            |           |           | 0.02              |           |           |
| Observations  | 758             |           |           | 544               |           |           |

Note: Marginal effects are the unconditional expected value:  $E(y|x)$ . ^, \*, and \*\* indicate 10%, 5%, and 1% significance levels.

<sup>1</sup> The F test rejects the joint hypothesis that the above twenty coefficients for Hope and non-Hope students are equivalent.

Table 5: OLS Estimation: Weekly study hours during Fall semester 2004

| Sample                                  | All students |                  | All students |                  | Full-time students |                  | Full-time students |                  |
|---|--------------|------------------|--------------|------------------|--------------------|------------------|--------------------|------------------|
|   | Coeff        | Robust Std Error | Coeff        | Robust Std Error | Coeff              | Robust Std Error | Coeff              | Robust Std Error |
| <b>Financial Assistance</b>             |              |                  |              |                  |                    |                  |                    |                  |
| Parents support (in \$1000s)            | 0.097        | 0.086            |              |                  | 0.085              | 0.097            |                    |                  |
| Federal support (in \$1000s)            | 0.398 **     | 0.099            |              |                  | 0.374 **           | 0.110            |                    |                  |
| HOPE support (in \$1000s)               | -0.603 ^     | 0.355            |              |                  | -1.194             | 0.854            |                    |                  |
| Total support (Parent + Federal + HOPE) |              |                  | 0.209 **     | 0.066            |                    |                  | 0.216 **           | 0.075            |
| <b>Student Characteristics</b>          |              |                  |              |                  |                    |                  |                    |                  |
| Age                                     | 0.160 **     | 0.061            | 0.165 **     | 0.062            | 0.180 *            | 0.074            | 0.178 *            | 0.075            |
| White                                   | 0.841        | 0.748            | 0.685        | 0.755            | 1.155              | 0.792            | 1.096              | 0.784            |
| Black                                   | 0.694        | 0.800            | 0.539        | 0.803            | 1.121              | 0.867            | 1.054              | 0.855            |
| Male                                    | 0.172        | 0.350            | 0.151        | 0.350            | 0.278              | 0.400            | 0.285              | 0.403            |
| SAT                                     | 0.000        | 0.001            | 0.000        | 0.001            | 0.000              | 0.001            | 0.000              | 0.001            |
| High School GPA                         | -0.063       | 0.223            | -0.065       | 0.221            | 0.017              | 0.265            | 0.007              | 0.260            |
| Car owner                               | 0.257        | 0.595            | 0.242        | 0.595            | 0.201              | 0.612            | 0.084              | 0.615            |
| Children ages 0 - 4                     | -1.496 ^     | 0.847            | -1.532 ^     | 0.878            | -1.005             | 0.959            | -1.007             | 1.006            |
| Children ages 5 - 14                    | -0.649       | 1.237            | -0.845       | 1.265            | -0.982             | 1.442            | -1.129             | 1.459            |
| Degree (high income potential)          | 0.713 ^      | 0.421            | 0.654        | 0.418            | 0.661              | 0.476            | 0.694              | 0.474            |
| Credit hours (enrolled Fall '04)        | 0.448 **     | 0.068            | 0.361 **     | 0.049            | 0.468 **           | 0.103            | 0.550 **           | 0.101            |
| <b>Parental Attributes</b>              |              |                  |              |                  |                    |                  |                    |                  |
| Female parent education (years)         | 0.063        | 0.064            | 0.068        | 0.063            | 0.084              | 0.072            | 0.086              | 0.072            |
| Male parent occupation                  | 0.115        | 0.115            | 0.114        | 0.115            | 0.206              | 0.132            | 0.190              | 0.133            |
| Favor work (parents)                    | 0.009        | 0.333            | 0.074        | 0.335            | 0.061              | 0.374            | 0.097              | 0.376            |
| Income parent (in \$1000s)              | -0.001       | 0.003            | -0.001       | 0.003            | 0.000              | 0.003            | -0.001             | 0.003            |
| Constant                                | -2.838       | 2.332            | -2.839       | 2.355            | -3.459             | 3.394            | -6.818 *           | 2.841            |
| Pseudo R <sup>2</sup>                   | 0.08         |                  | 0.07         |                  | 0.06               |                  | 0.06               |                  |
| Observations                            | 1,325        |                  | 1,325        |                  | 1,100              |                  | 1,100              |                  |

Note: ^, \*, and \*\* indicate 10%, 5%, and 1% significance levels, respectively.

Figure 1: Financial Aid and Student Employment Hours in Fall 2004

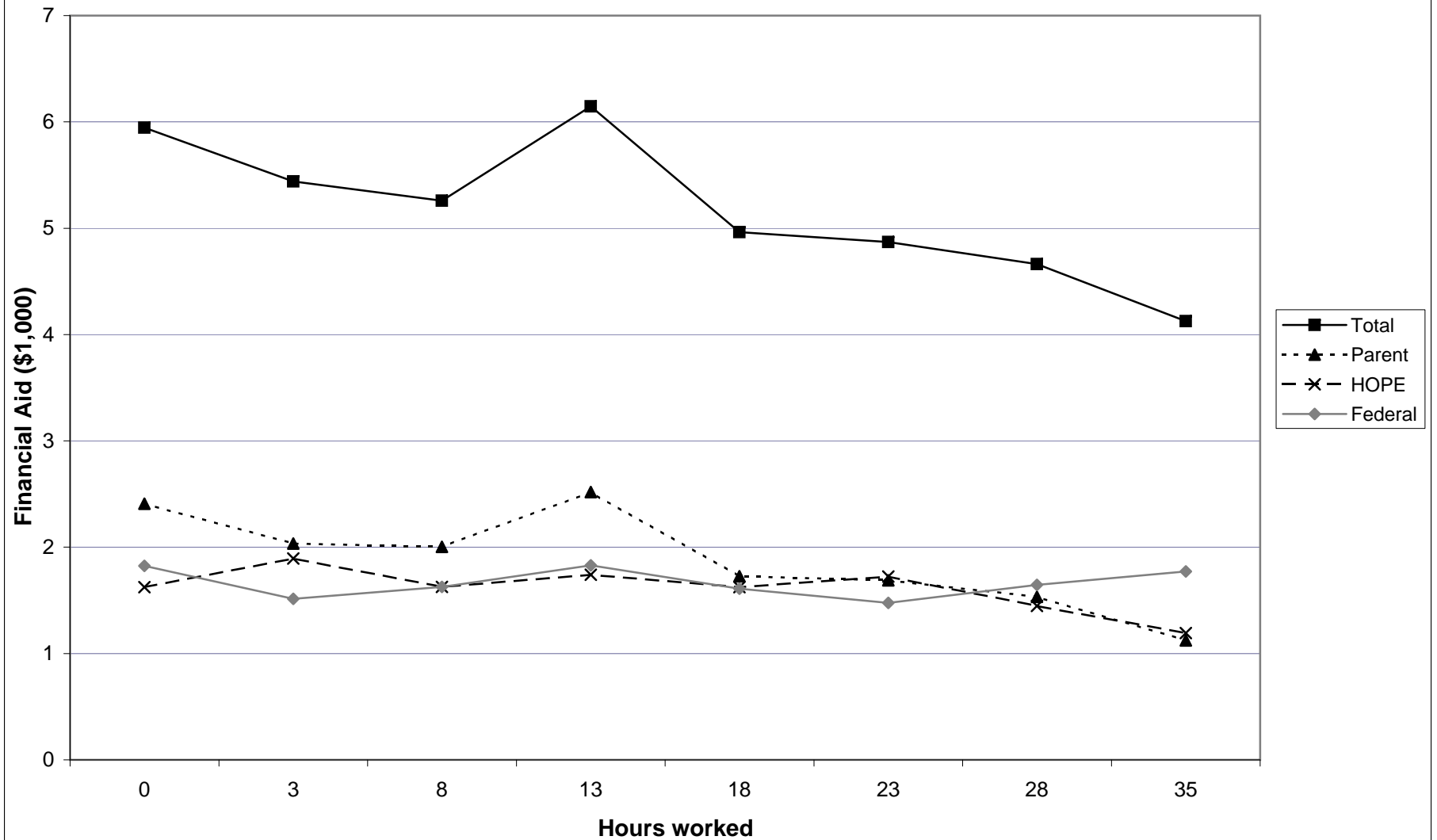


Figure 2: Financial Aid and Hours Studying

