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Rebecca Morris April 4, 2013

The Effects of Higher Education Tax Benefits and Aid Information on College Decisions

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Abstract

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In recent years, tax-based federal aid in the form of the Hope and Lifetime Learning Tax Credits as well as the Tuition Deduction has become a potential funding source for individuals interested in pursuing higher education. This paper analyzes the relationship between post-secondary financial aid distributed through the tax system and the decisions to apply to college, enroll in college, and complete a year of college for dependents between the ages of 18 and 23. Using policy variations in income and benefit limits to estimate the aid's effects, this study finds that the amount of tax benefit an individual is eligible to receive does not increase the probability that an individual decides to apply to college, enroll in college, or a complete a year of college. However, receipt of financial aid information was found to have economically and statistically significant effects for the three college decisions studied, with an associated increase in the probability of enrolling equivalent to 8.5 percentage points, an increase in the probability of applying equivalent to 27 percentage points, and an increase in the probability of completing a year of college equivalent to 17 percentage points. High frequency of discussions with parents about college attendance also resulted in significant increases in the probabilities analyzed in this paper.

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I. Introduction

Federal policy pertaining to financing higher education was written with the intent of increasing the ability of individuals to attain college educations. Higher education has become increasingly important for an individual's economic success. The Bureau of Labor Statistics (2012) reported that in 2011 individuals (ages 25 and over with only a high school diploma) earned weekly wages that are $81 lower than those who have attended some college, $138 lower than individuals with an Associate degree, and $415 lower than those with a Bachelor degree. Additionally, the sample who had post-secondary education had a lower unemployment rate in 2011, with high school graduates experiencing a 9.4% unemployment rate and Associate degree holders subject to a 6.8% unemployment rate. Though a degree has become increasingly crucial in securing a well-paying job, Belley and Lochner (2007) suggest that family income has become more essential in determining if an individual will enroll in college. In order to correct the inequality of higher education accessibility and its later effects on individual's economic opportunities, the government has motivation to provide aid to individuals who wish to enroll in postsecondary education.

Several items, such as Pell grants and federal student loans, have been provided to help individuals pay for their schooling. In 1998, the federal government began using tax-based aid in the form of the Hope and Lifetime Learning tax credits, and in 2002, the federal government added a tax benefit in the form of a tuition deduction. In this paper, I test the hypotheses that the probabilities of enrolling in college, applying to college, and completing a year of college increase as the value of these forms of tax based aid increase. I also test the hypotheses that

knowledge of financial aid increases the likelihoods that individuals enroll in college, apply to college, and complete the first year of college.

This paper focuses on the higher education decisions of individuals between the ages of 18 and 23. I use data from the National Longitudinal Survey of Youth 1979 and the National Longitudinal Survey of Youth- Child and Young Adult for the study and utilize policy changes during the 1996-2008 survey years, which are conceivably exogenous to unspecified determinants of decisions regarding applying, enrolling, and completing college. I find relationships that are largely statistically insignificant between the amount of tax incentive for which an individual qualifies and enrollment, application, and completion decisions. The magnitude of the relationship appears economically insignificant as well, with a hundred dollar increase in tax benefits associated with a decrease in the probability equivalent to less than 1 percentage point in the weakly statistically significant cases (significant at the 10% level only) for enrollment. Awareness of financial aid information, however, is significant at the .1% level. Utilizing the full samples available for each question suggests that the probability of enrolling in college increases 8 percentage points, the probability of applying to college increases by 27 percentage points and the probability of completing a year of college increases by 17 percentage points for individuals who report that they or their parents have received financial aid information.

II. Program Details

Over the past several years, tax-based federal aid for higher education has played a significant role in both federal taxes and student financial aid. The Taxpayer Relief Act of 1997 introduced the Hope credit and Lifetime Learning credit. Tax-based higher education aid was further expanded with the institution of the tuition deduction under The Economic Growth and

Taxpayers' Relief and Reconciliation Act of 2001. While this paper only includes data from years 2008 and earlier, it should be noted that in The American Recovery and Reinvestment Act of 2009, the American Opportunity Tax Credit temporarily replaced the Hope Tax Credit with more generous benefits and provided availability to people within a wider range of income. Though this credit was scheduled to revert back to the Hope Tax Credit after tax year 2012, the American Taxpayer Relief Act of 2012 has extended the American Opportunity Tax Credit to remain law through 2017. The American Taxpayer Relief Act of 2012 also has extended the previously expiring tuition deduction to last through 2013.

The cost of the tax incentives is significant, with the bulk of the benefits going toward families typically designated as "middle income." The Government Accountability Office (2005) reports that in tax year 2002, 3.3 million tax filers claimed $3.2 billion in Hope credits, with median income of filers who claimed the benefit equal to $39,203. An additional 3.5 million tax filers claimed $1.7 billion in Lifetime Learning Credits and had a median income of $39,706. Furthermore, 3.4 million filers claimed $1.3 billion in tuition deductions. Because individuals must have sufficient tax liability to claim the benefits and not exceed the income thresholds, low-income and high-income filers are ineligible for the benefits.

Each of these three tax incentives allow tax filers to use qualified education expenses to calculate the amount of a given tax break they can claim. While tuition is a qualified education expense, other relevant fees are only appropriate for consideration if individuals must pay an eligible educational institution in order to enroll or attend. According to the Internal Revenue Service's (IRS) Publication 970, items such as room and board, books, supplies, equipment, and student activities are not included. Expenses paid with non-taxable income such as tax-free scholarships or Pell grants are not considered qualified education expenses. Taxpayers may

claim the tax incentives on behalf of themselves or their dependents for whom they claimed an exemption if the filer paid school expenses for the student in question. Only one of the incentives can be claimed per student. Though each incentive can be claimed for multiple students per tax return, the Hope credit maximum is defined in terms of each student whereas the Lifetime Learning credit and tuition deduction maximums are capped per return. Married couples who file separately are unable to utilize these incentives. Tables 1, 2, and 3 provide descriptions of the income limits and incentive maximums for the years covered.

Table 1: Hope Tax Credit

		Hope Tax Credit	Benefit Calculation
1998	Benefit Maximum	1500	100% first $1,000; 50% next $1,000
	MAGI Limit for Maximum	$40,000 (single) $80,000 (joint)	(For expenses paid after 12/31/1997)
	MAGI Phase-Out Region	$40000-$50000 (single)	
		$80000-$100000 (joint)	
2000	Benefit Maximum	1500	100% first $1,000; 50% next $1,000
	MAGI Limit for Maximum	$40,000 (single) $80,000 (joint)	
	MAGI Phase-Out Region	$40000-$50000 (single)	
		$80000-$100000 (joint)	
2002	Benefit Maximum	1500	100% first $1,000; 50% next $1,000
	MAGI Limit for Maximum	$41000 (single) $82000 (joint)	
	MAGI Phase-Out Region	$41000-$51000 (single)	
		$82000-$102000 (joint)	
2004	Benefit Maximum	1500	100% first $1,000; 50% next $1,000
	MAGI Limit for Maximum	$42,000 (single) $85,000 (joint)	
	MAGI Phase-Out Region	$42000-$52000 (single)	
		$85000-$105000 (joint)	
2006	Benefit Maximum	1650	100% first $1,100; 50% next $1,100
	MAGI Limit for Maximum	$45,000 (single) $90,000 (joint)	
	MAGI Phase-Out Region	$45000-$55000 (single)	
		$90000-$110000 (joint)	
2008	Benefit Maximum	1800	100% first $1,200; 50% next $1,200
	MAGI Limit for Maximum	$48000 (single) $96000 (joint)	
	MAGI Phase-Out Region	$48000-$58000 (single)	
		$96000-$116000 (joint)	

Credit phase-out is linear over the specified phase-out region. MAGI indicates Modified Adjusted Gross Income. Filing status is in parentheses. Data from IRS Publication 970 years 1998-2008.

Table 2: Lifetime Learning Tax Credit

		Lifetime Learning Tax Credit	Benefit Calculation
1998	Benefit Maximum	1000	20% first $5,000
	MAGI Limit for Maximum	$40,000 (single) $80,000 (joint)	(For expenses paid after 6/30/1998)
	MAGI Phase-Out Region	$40000-$50000 (single) $80000-$100000 (joint)	
2000	Benefit Maximum	1000	20% first $5,000
	MAGI Limit for Maximum	$40,000 (single) $80,000 (joint)	
	MAGI Phase-Out Region	$40000-$50000 (single) $80000-$100000 (joint)	
2002	Benefit Maximum	1000	20% first $5,000
	MAGI Limit for Maximum	$41000 (single) $82000 (joint)	
	MAGI Phase-Out Region	$41000-$51000 (single) $82000-$102000 (joint)	
2004	Benefit Maximum	2000	20% of first $10,000
	MAGI Limit for Maximum	$42,000 (single) $85,000 (joint)	
	MAGI Phase-Out Region	$42000-$52000 (single) $85000-$105000 (joint)	
2006	Benefit Maximum	2000	20% of first $10,000
	MAGI Limit for Maximum	$45,000 (single) $90,000 (joint)	
	MAGI Phase-Out Region	$45000-$55000 (single) $90000-$110000 (joint)	
2008	Benefit Maximum	2000	20% of first $10,000
	MAGI Limit for Maximum	$48000 (single) $96000 (joint)	
	MAGI Phase-Out Region	$48000-$58000 (single) $96000-$116000 (joint)	

Credit phase-out is linear over the specified phase-out region. MAGI indicates Modified Adjusted Gross Income. Filing status is in parentheses. Data from IRS Publication 970 years 1998-2008.

Table 3: Tuition Deduction

		Tuition Deduction	Benefit Calculation
1998, 2000	Maximum	N/A	N/A
	MAGI Limit for Maximum	N/A	
	MAGI Phase-Out	N/A	
	Phase-Out region Maximum Deduction	N/A	
2002	Maximum	$3,000	
	MAGI Limit for Maximum	$65,000 (single) $130,000 (joint)	equal to qualified fees/tuition or maximum deduction, whichever is smaller
	MAGI Phase-Out	N/A	
	Phase-Out region Maximum Deduction	N/A	
2004-2008	Maximum	$4,000	
	MAGI Limit for Maximum	$65,000 (single) $130,000 (joint)	equal to qualified fees/tuition or maximum deduction, whichever is smaller
	Phase-Out region Maximum Deduction	$80,000 (single)	
		160000 (joint)	
	Maximum Partial Deduction	$2,000	

Data from IRS Publication 970 years 1998-2008. Filing status is in parentheses.

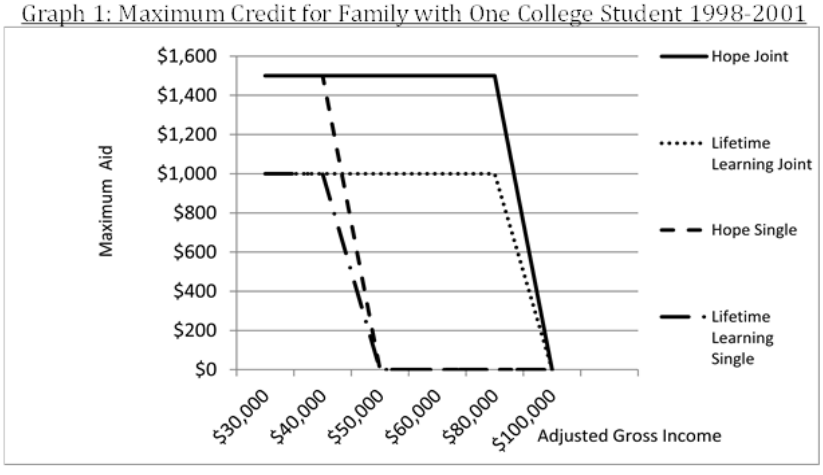
Students are only eligible for the Hope credit if they are in the first two years of their higher education. Additionally, students are only eligible if enrolled at least halftime during the tax year. The original maximum credit awarded was $1,500, with 100% of the first $1,000 and 50% of the next $1000 spent on education. These maximums increased to $1,650 in 2006 and $1,800 in 2008 (IRS Publication 970). Income qualifications are based on Modified Adjusted Gross Income and are periodically adjusted. Also, the determination of the maximum amount an individual may claim includes an income-based linear phase out.

The Lifetime Learning Tax Credit is similar to the concept of the Hope Credit but differs from the Hope Credit in multiple respects. As of 2003, the tax credit provides a maximum of $2,000 of coverage, 20% of the first $10,000 of qualified expenses. Under the original law, the credit was a maximum of 20% of the first $5,000 (IRS Publication 970). In contrast to the Hope credit, the Lifetime Learning Credit has no requirement for the number of credit hours in which a

student must be enrolled in order to qualify and has no limit on the number of years for which it can be claimed. Modified Adjusted Gross Income limits are identical for the Hope and Lifetime Learning credits.

The tuition deduction is an above the line deduction. In contrast to the tax credits, which are subtracted from federal tax liability, the tuition deduction is subtracted from taxable income. Therefore, the value of the tuition deduction is dependent upon the filer's marginal tax rate. Similar to the Lifetime Learning Credit, the tuition deduction has no required number of credit hours for eligibility and can be used for any number of years. The tuition deduction has higher Modified Adjusted Gross Income thresholds than the credits and lacks a linear phase-out. Beginning in 2004, the income threshold was modified, with individuals who earned below $65,000 and who were single ($130,000 married filing jointly), eligible for a deduction of up to $4,000, and individuals earning above these amounts and below $80,000 ($160,000 if married filing jointly), were eligible for a deduction of up to $2,000. Graph 1 demonstrates the maximum tax credit amount individuals can claim for the early years of the credit programs, assuming sufficient tax liability.

Graph 1: Maximum Credit for Family with One College Student 1998-2001



The size of these potential awards is fairly substantial when compared to average college costs. According to the National Center for Education Statistics (2011), in the 2000-2001 school year, the average cost of tuition and room and board for full time undergraduates was $10,820, with a cost of 5,466 for two year institutions. In 2008 the average cost increased to $ 17,092. While the education tax-benefits do not compensate entirely for these costs, which continue to increase (faster than inflation), they still may potentially cover a significant portion of the cost of attendance.

III. Literature Review

Scholars such as Dynarski and Scott-Clayton (2006) and Long (2004) have expressed concern that these tax-based incentives subsidize individuals who would have attended college without their presence. Despite the possibility of large portions of the tax incentives going toward people who would have attended postsecondary school anyway, the policies may have other significant benefits. If another purpose of the tax incentives is to decrease student debt, which Burgdorf and Kostka (2006) suggest is an important goal, subsidizing such students and potentially lowering their student debt, may be a socially desirable outcome. High levels of student debt may discourage individuals from pursuing lower-paying careers that benefit society such as jobs in the fields of social work and education.

Additionally, tax-based aid has the advantage of easier paperwork. Dynarski and Scott-Clayton (2006) found that the Free Application for Federal Student Aid (FAFSA) took families that had already completed their taxes approximately 10 hours to complete. In comparison, in order to obtain the Hope and Lifetime Learning tax credits, taxpayers need to only complete one additional tax form. Despite this advantage, reports of tax incentive take-up have varied. Long's

(2004) works suggests that only approximately 27% of students eligible for the credits according to income and attendance actually claimed the credits in the early years of the programs. However, the Government Accountability Office (2012) utilized 2009 IRS data and found that only 14% of filers failed to claim an education tax credit or deduction for which they were eligible. The Government Accountability Office further found that in 2009, approximately 40 percent of filers who claimed the tuition deduction would have increased their tax benefit by claiming the Lifetime Learning Credit instead. The average loss of benefit for these filers was $284. Additionally, 2 percent of filers who claimed the Lifetime Learning credit would have maximized their benefit by claiming the tuition deduction instead.

The tax credits and tuition deduction have a limited effect on one's ability to attend college, given the timing of filing taxes versus the timing of enrolling in school. These incentives do not help individuals who fail to attend school due to liquidity constraints. However, Turner (2011) suggests that one benefit of this design is that it minimizes the potential for enrollment by individuals ill-suited for college who want the benefits. Although individuals are able to plan ahead for the benefits and adjust their witholdings accordingly, Jones (2010) suggests that many taxpayers fail to do so.

Another complication in the effectiveness of the tax credits and tuition deduction is how colleges have responded to the policy changes. Long (2004) argues that the time lapse between tax returns and tuition and fees payment may prevent postsecondary institutions from increasing prices. However, Turner (2012) suggests that four year postsecondary institutions may lower grant aid by up to the full amount of tax-based aid for which students qualify. In such a scenario, eligible individuals might not experience any cost reduction from tax incentives. Still, enrollment effects might result from a decrease in uncertainty regarding school aid. Cellini (2009) indicates

that uncertainty regarding the cost of schooling may dissuade potential students from enrolling in post-secondary education.

A few studies have analyzed the effects of the Hope credit, Lifetime Learning credit, and the tuition deduction on college enrollment and have found mixed results. Long (2004) looks at the effects of the Hope and Lifetime Learning credits on college enrollment between 1996 and 2000. She uses data from the October Current Population Survey and, employing a difference-in-difference model, finds no enrollment effect. LaLumia (2010) utilizes a fixed effects model and data from the 1998 to 2006 rounds of the National Longitudinal Survey of Youth 1979 (NLSY79) in order to study the effects of the tax benefits on adult college enrollment. For her general sample, she found no enrollment effects. In limiting her sample to adult males who had not obtained their desired level of education, she found that the probability of enrollment increases between 2.5 and 3.4 percent. Both Long and LaLumia compare eligible individuals to ineligible individuals.

Turner (2011), however, uses data from the 1996 and 2003 waves of the Survey of Income and Program Participation and found that the tax incentives increased college enrollment rates for 18 to 19 year olds by approximately 7%, full time enrollment by approximately .3 percentage points for an increase in $100 of education tax benefits. He uses time series and cross sectional variation in program generosity among individuals whose family income makes them potentially eligible. His results are robust to inclusion of individuals outside of income eligibility limits. These three studies rely on use of the eligible sample rather than on the claiming sample, likely reducing the apparent effects of the higher education tax benefits.

Several scholars have also studied the effects of financial aid on college persistence. LaLumia (2010) investigates whether eligibility for the higher education tax incentives impacted

college completion and finds no evidence that it did. Dynarski (2003) finds that "offering $1,000 ($1998) of grant aid increases educational attainment by about 0.16 years and the probability of attending college by four percentage points." Turner (2011) also suggests that the education tax-based aid increases the probability of pursuing a second year of college for individuals who have enrolled in their first year.

This paper provides additional insight into the studies of the relationship between the tax benefits and enrollment and college persistence, utilizing the specific income data provided in the NLSY79 surveys, control variables for relevant personal factors that are not included in other models, and variation within tax benefit amounts during the years of the program. Additionally, this study explores the impact of financial aid information and the size of tax benefits on the decision to apply to college, which has not been a focus for other analyses of the education tax benefits.

IV. Data and Income Construction

I use data from the 1996-2008 rounds of the NLSY79 and NLSY79 Children and Young Adults. This data allows me to link young adults to their biological mothers. I utilize the income information from the mothers in the NLSY79 and merge this with information regarding school enrollment and individual characteristics pertaining to the young adults. During this time period, surveys were only given for even years.

Similar to LaLumia (2010), who used the NLSY79 as well, I use NBER's TAXSIM (Feenberg, 1993) program to calculate adjusted gross income for each individual for each tax year examined in the study. However, I update income with the most recent data available for each survey year, while LaLumia holds income constant, adjusting for inflation. She studies the way the NLSY79 respondents react to tax incentive amounts, so the amount of income an

individual makes is endogenous to enrollment decisions. However, I am measuring the effects for their children, so it is appropriate to update the data with the most recent information available.

The most recent income information available is from the previous calendar year for a given survey year. I calculate the mother's wages, spouse's wages, farm and business income, and other income, which includes sources of income such as interest on savings or bonds, dividends, royalties, or pensions. I use the most recent data available and adjust for inflation using the Bureau of Labor Statistics CPI calculator. There is a possibility that using past income provides inaccurate estimates of income for the years being studied; however, for each year included in the study, between 85% and 95% of the mother's responses were from the past two surveys, which minimizes this problem. This methodology does not account for changes in income that may occur between the year of the income being used and the year being examined. Therefore, if income changes by more than just inflation, the model will fail to incorporate these changes.

Other income and farm and business income is set to zero if no data is available. I additionally include measures for income from military wages and unemployment compensation from the past year, setting them to zero if no data is available. I remove individuals who report working in the past year but for whom I cannot derive a salary measurement from previous responses.

While income information is for previous years, marital status is for the present survey year, which allows spouse income to be set to zero for individuals who are no longer married. This technique may fail to account for spousal income for individuals who married the year of the survey, which would bias adjusted gross income (AGI) toward zero. NLSY79 asks questions

about filing taxes for the previous calendar year; however, response rates are imperfect, and some individuals did not report filing taxes, though their income level indicates that they made more than the filing threshold. For TAXSIM purposes, I set filing status to head of household if an individual is unmarried, even if she reported filing as single, since they would be eligible if they claimed their child as a dependent. I set filing status to joint for all married couples, even if they reported filing separately, for purposes of calculating adjusted gross income. However, in calculating their tax incentive eligibility, I set it to zero because they do not meet the filing requirements. Approximately 3%-6% of observations are individuals whose parents are married filing separately in the various samples specified.

I derive number of dependents from data regarding number of individuals in household, replacing this number with number of exemptions claimed if a response is available. I check these numbers by comparing them with the number from the previous survey and the next survey. If no number is provided, I set the number of dependents equal to one, as the youths in question would have to be dependents for the parents to claim the tax incentives. I derive number of dependent children under the age of 17 by analyzing the birth year of the children the mothers report.

It is important to note that I fail to account for state taxes, as local information is not available. However, as LaLumia (2010) states in her study, because eligibility depends on federal tax parameters, missing state information is not extremely troubling. Also similar to LaLumia (2010), I use homeownership as a proxy for itemizing. I use the most recent homeownership data available, setting no as the default. If an individual has reported owning a home, I use inflation-indexed 1998 IRS statistics, which categorize individuals by income level and filing status, to

compute average amount of itemized deductions claimed. If an individual does not report owning a home, the standard deduction is used.

I restrict the young adults to those who may qualify as dependents according to the Internal Revenue Service. I remove individuals who are married or who have children. Additionally, individuals who report living in a household with their fathers and not their mothers are removed from the sample, as are individuals who stated that they last lived with their mother more than two years prior to the year in question or who stated they see their mother a few times a year or less. All of the youths specified are between the ages of 18 and 23. Individuals under the age of 24 may be claimed as dependents if they are enrolled in school fulltime. I do not consider youth income in my restrictions as income is endogenous to enrollment and therefore dependency status. I further remove individuals who have not received a high school diploma or GED at the time of the interview when analyzing college enrollment questions.

The timing involved with this dataset presents multiple complications. In even years, surveys were given throughout the year, so while some respondents may have answered questions in February, others may have answered in August. The month in which the bulk of youths responded to survey questions differs by year as well.

V. Empirical Strategy

I utilize the following model to estimate the effect of the education tax incentives on the binary variable current college enrollment status, using both OLS and a probit model. Subscripts i and t indicate individual and year respectively.

$$\text{Enrollment}_{it} = \beta 1 Incentive_{it} + \beta 2\, X_{it} + \sum_1^n \delta_k t_k + \epsilon_{it}$$

The dependent variable "enrollment" pertains to college enrollment status for an individual at the time of the survey. I also use the binary variables Apply and Complete. The apply dependent variable indicates whether a respondent in their senior year of high school reported applying to college. College application information is only available as of 2000, so data prior to 2000 is removed from these regressions, as is data from 2008 due to lack of eligible participants. The complete dependent variable indicates whether an individual has completed one or more years of college. I utilize information from one survey for the independent variables and construct the dependent variable from the next survey to analyze whether tax incentives led to completion of a year of college. For this reason, I only use data from independent variables for the years 1998, 2000, 2002, 2004, and 2006. I use data from dependent variables for 2000, 2002, 2004, 2006, and 2008.

I utilize differences in program maximums and income cut-offs over the period in question as well as differences in filing status, AGI, and federal tax liability to calculate differing amounts of tax incentives. I use the Bureau of Labor Statistics CPI calculator so that the monetary amounts are comparable across the survey years. All monetary amounts are expressed in 1998 dollars. A graphical representation of the tax benefit size and AGI can be found in Graph 2. I assign the entirety of the tax benefit for a survey year to the school year in which individuals respond to the survey, which may differ between respondents based on when during the year they were interviewed. Similar to Turner (2011), I measure the tax aid in hundreds of dollars so that the regressions assess the effect of $100 of benefit for eligible young adults, assuming respondent spending that is at least as large as the program limits. The calculation for tax incentive amount may be subject to multiple inaccuracies. First, I use AGI instead of MAGI for my calculations. This difference likely causes no change, as MAGI simply includes foreign

earned income and foreign housing deduction. Secondly, I assume college spending is at least equivalent to the amounts needed to qualify for the maximum amount of incentive an individual may receive based on their income and tax liability. However, this assumption is possibly inaccurate. Individuals who reported college costs had average college costs significantly lower than the average college costs reported by the National Center for Education Statistics (2011). I do not account for these reported costs though, as only individuals who were enrolled in college responded and cost of schooling is endogenous to the decision to enroll. Additionally, the average college costs reported by the NCES do not always exceed the amounts necessary to qualify for the full tax benefits. In alternative specifications that are not shown in this paper, I utilize average college spending by year, as reported by the NCES, as this issue may be particularly significant in determining the amount of Lifetime Learning Tax Credit for which an individual qualifies, from years 2004-2008. These regressions show no change in the key tax benefit variable in comparison to the regressions shown in this paper. The calculation also does not account for 2008 maximum education tax incentive, which may be larger for students in Midwestern natural disaster areas.

The calculation may be inaccurate for families with multiple college-aged individuals. However, in each of the samples specified, in a given year, approximately 74% of families only have one child who meets the requirements and approximately another 22% have two children who meet the requirements, making this inaccuracy not particularly troubling. Families with more than one eligible child may be subject to unique circumstances that change the amount of tax incentive for which an individual qualifies. Tax liability may be insufficient to support multiple tax benefit recipients, or both individuals may qualify for only the tuition deduction or Lifetime Learning credit, both of which are subject to maximums per return rather than per

individual. Both of these circumstances would make tax benefits larger than they would be realistically. Additionally, the parents may decide themselves to go back to school. This is less problematic though, as LaLumia's (2010) study of the NLSY79 revealed low enrollment rates among the sample, which is the sample from which parent data is derived in this study. Families may also choose to divvy up benefits inequitably between eligible youths. Rather than attempt to account for these possible decisions, I assume each individual is eligible for the tax incentive they would be eligible for if they were the only eligible youth in their family.

Furthermore, as the Government Accountability Office (2012) found, individuals do not necessarily choose the benefit-maximizing option. In line with previous studies, I assume individuals choose the maximum benefit. Additionally, I do not include the consideration that families may claim less than the maximum amount of tax incentive so that they can avoid the alternative minimum tax. Lastly, the amount of tax incentive a parent can claim is contingent upon the amount they pay for their child's education. I do not account for financial aid or individuals who have people other than their parents pay for school. The assumption that parents pay for school is rational given that individuals who would benefit from the tax incentives would also likely benefit from financial aid one would receive as determined by FAFSA, which requires that individuals who are under the age of 24 report their parents' incomes in determining expected contributions toward school payments.

I account for time effects using dummy variables for the survey years, which encompass even years between 1996 and 2008 depending on the dependent variable and sample. Each $\delta_k t_k$ represents a dummy variable and its coefficient for a year t_k, where $t_k=1$ if subscript t equals t_k. In the above specified equation, the reference category is 1998 (k=0), though the reference category changes for different enrollment samples and dependent variables. Additionally, in other

regressions, there are fewer years available so the number of dummy variables decreases to fit the number of survey years used (leaving out one survey year to serve as the reference category).

In X_{it} I control for adjusted gross income (AGI), frequency of college discussion with parents, receipt of financial aid information, age, and highest grade an individual desires to complete. I account for AGI in 1998 dollars using its logarithm. Income is converted to 1998 dollars using the Bureau of Labor Statistics CPI calculator.

Frequency of college discussion is measured on a scale of 0 to 3, with 3 indicating often. I create a dummy variable equal to one for people who respond with the highest response "often." Non-responses compose only 1.48% of the primary sample and are not included in the "often" category. Receipt of financial aid information is a dummy variable indicating whether an individual or his or her parents have received financial aid information. The type of financial aid information is not specified. I control for age using dummy variables for ages 19, 20, 21, and 22-23. I also create a dummy variable for individuals who want to complete 16 years of education or more. I use previous survey data and update the variables if newer information is available for a given survey year.

I also control for Peabody Individual Achievement Test (PIAT) Math and Reading Comprehension percentiles, mother's level of education, and mother's age at birth of individual. Missing values for the PIAT percentiles are given the sample mean. For the primary sample, 1.45% of math percentiles were missing and 2.48% of reading comprehension percentiles are imputed. Additionally, I use dummy variables for information about the individuals' mothers. For mother's level of education, I use a dummy variable indicating if the mother has completed more than 12 years of formal education. For age at birth, I use a dummy variable if the mother reported giving birth to her child at age 25 or older. I do not include data on respondents' fathers

due to low response rates to relevant questions. I also control for gender with a binary variable of a value of one equivalent to female. Weighted summary statistics can be found in Table 4.

Similar to LaLumia (2010) and Turner (2011), I cluster standard errors at the individual level to prevent serial correlation. Individuals may appear in the sample 1 to 3 times. Though I have access to many potentially explanatory variables and am able to construct more specific income measurements, my sample sizes are significantly smaller than those used in previous studies. I use between 400 and 4,000 observations while other studies utilize tens of thousands, limiting the specific tests I can run. In contrast to the studies done by LaLumia, Turner, and Long, this study does not provide sufficient information for college-related decisions prior to the initial year in which the credits went into effect for most tests. Few respondents were of college age prior to 1998.

In using pooled cross-sectional analysis, I assume that unobserved determinants of the size of education tax benefits are uncorrelated with the dependent variables. Turner (2011) argues that policy induced variation is conceivably exogenous to enrollment decisions. Unfortunately, I do not have access to specific geographic information, which likely plays a role in multiple variables including income and cost and accessibility of colleges. Turner (2011) is able to control for location at the state level and finds positive enrollment effects. Although I am able to create a dummy variable for urban vs. rural location, it does not contribute to the specification of the model. Additionally, LaLumia indicates that potential determinants such as motivation could bias estimates in a pooled cross-sectional model; however the control variables regarding the desire to complete college and frequency of college attendance discussions with parents likely minimizes this effect. LaLumia uses a fixed effects specification to avoid this

problem, but due to low numbers of observations per respondent, this approach is not feasible for this dataset. Her results generally indicate no effects, though she studies a different age group.

Income eligible regressions were done using the income-eligible portion of the sample for enrollment status. As the partial tuition deduction is only available for years 2004 through 2008 but the maximum AGI remains $160,000 for joint filers ($80,000 for single/head of household), I set the upper limit equal to $160,000 ($80,000) for years 1996-2002 as well. I use a "full" sample that includes individuals whose parents have made at least $10,000 but whose families do not necessarily have positive federal income tax liability and families who have AGI up to $200,000 (1998 dollars). I do not include individuals with income below the $10,000 limit due to inaccuracies in estimations caused by low response rates. I do not include individuals with incomes above $200,000 due to top-coding issues. I run regressions with a third sample, only individuals who are eligible for the tax credits. Lastly, I use a sample that only includes individuals who are above the cut-off for the education tax credits but who may or may not qualify for the tuition deduction.

Due to low sample sizes, I run the full sample for completion and application regressions. Inclusion of individuals outside the income limits relies on the assumption that other changes in financial aid do not differ between groups, an assumption that LaLumia (2010) and Long(2004) make in their primary analysis and that Turner(2011) makes in his robustness checks. Turner's results do not change with the inclusion of these groups.

It is important to note that using this empirical strategy will likely bias the effects of the tax benefits toward zero. In studying eligible samples rather than individuals who actually report using the Hope credit, Lifetime Learning credit, or tuition deduction, I probably assign benefits to individuals who do not use them. Additionally, the loose construction of eligibility by

dependency status may also bias results toward zero. It is possible that individuals are living as independents for tax purposes or are not dependents of their mothers. However, given that individuals concerned with financial aid would have to fill out a FAFSA form using their parents' income except in a few extreme cases, the assumption is justifiable.

VI. Results and Discussion

Enroll

Utilizing OLS and probit models (average marginal effects for the probit model), the maximum value of tax incentive has a statistically significant negative effect at the 10% level on post-secondary school enrollment for the full sample (Table 5). The model surprisingly predicts that for an increase of $100 in tax benefits the probability of enrolling in college decreases by approximately .3 percentage points. While statistically significant, the magnitude of the effect suggests the impact of an additional $100 is small.

It is important to note that estimates for income and tax benefits are measured imprecisely, which likely impacts results. The removal of individuals with incomes below $25,000 (1998 dollars) or limiting the sample to the income eligible sample (income eligible sample results displayed in columns 3 and 4 in Table 5), results in statistically insignificant measures. The income eligible sample suggests that an increase of $100 dollars of aid decreases the probability of enrolling in college by approximately .2 percentage points. These samples remove individuals whose incomes (and federal tax liability) may have been most strongly biased toward zero due to the methodology used in constructing income, potentially explaining why, unlike Turner (2011), results for the eligible sample were not robust to the addition of individuals on either side of program limits. This idea is contingent upon the possibility that high

income people did not report many of their forms of income and so had an extremely low reported AGI. Previous literature suggests that family income is an extremely important determinant in whether young adults enroll in college. Therefore, such bias could result in a smaller or no tax benefit, while simultaneously masking higher incomes which would likely increase the probability of enrolling college. This may explain the seemingly negative effects of an increase in tax benefit.

Full and income eligible samples utilizing a benefit eligibility dummy variable rather than an amount of tax benefit yielded statistically insignificant results (Table 7). These results seem to imply that eligibility for the benefit is insignificant while the amount for which one is eligible, for the full sample, has a negative relationship with enrollment. This may suggest that the statistical significance of the amount of the benefit one may receive is a reflection of income rather than of the benefit itself, as higher income individuals receive smaller benefits. When using the eligible dummy variable for the income eligible sample, the sign and magnitude of the effect align with expected results, given previous studies. The probability of enrolling in college increases 4 percentage points for individuals who are eligible for a tax benefit, a sizable amount; however, the relationship is statistically insignificant. Within this sample, 90% of individuals are eligible for some form of tax benefit. Individuals who are not eligible have parents who are married filing separately or have incomes above the credit limits and appear in years prior to the enactment of the tuition deduction.

Alternate samples (not shown) including individuals who were likely not dependents and who would therefore have a benefit of zero from their mothers, produced positive and significant results. This relationship is misleading though as individuals who are ineligible by dependency likely exhibit very different college enrollment patterns due to differences such as marital status,

which eliminate them from the sample. Because their benefit is zero, it makes the tax subsidy look more significant than it actually is. In fact, the benefit is likely not zero in reality. It's just uncertain as to who would pay for college. Nonetheless, this finding indicates that enrollment patterns likely differ based on dependency status, which is logical given the different lifestyles of dependents versus independents and the financial aid assumption of parental financial contribution for school expenses.

I further differentiate the respondents by eligibility for tax credits and individuals whose income exceeds the limits for Hope and Lifetime Learning credits (Table 6). If the sample is limited to individuals who qualify for the tax credits, eliminating the higher income individuals who may or may not qualify for the tuition deduction, the impact of the maximum tax incentive becomes (statistically) significant with a negative sign at the 10% level. Results for this sample suggest that an increase of $100 dollars of aid decreases the probability of enrolling in college by approximately .4 percentage points, implying an economically small impact. The rationale behind this pattern could be similar to the above significant negative findings. Regressions (not shown) eliminating individuals who are in the linear phase-out region of the credits (486 respondents) result in an insignificant tax benefit. This suggests that the negative significance found is possibly due to individuals along the linear phase-out who receive smaller benefits as their income increases. Following this logic, it is possible that the negative significance of the tax incentive is a reflection of the fact that generally, individuals with higher credit amounts have lower incomes (excluding individuals with tax liability close to zero), though in any case, the magnitudes are economically small.

If the sample is limited to individuals who qualify only for a tuition deduction or no tax incentive at all, the sign of the benefit coefficient becomes positive. The magnitude of the effect

is roughly .7 percentage points, a larger effect than was found in the other subsamples tested; however, the coefficient of the maximum tax benefit is statistically insignificant

Receipt of financial aid information is statistically and economically significant at the .1% level for all subsamples studied. With the probability of enrolling in college increasing by roughly 8.5 percentage points for the full sample, 8 percentage points for the income eligible sample and credit eligible sample, and 11.7 percentage points for the higher income sample (using the probit regression in Table 6). It is interesting that receipt of financial aid information has a larger magnitude for the higher income individuals than the other groups, since this sample likely needs less financial aid on average in order to attend college. Perhaps these individuals are more likely to use the information they receive. Possibly aid is limited, and lower income respondents were more likely to view the aid that they might receive as sufficient, though colleges do give higher amounts of aid to lower income individuals. Furthermore, the significance of receipt of financial aid information does not necessarily represent only information about aid but may also represent planning ahead for one's future or connections with knowledgeable individuals who gave the respondents the aid information. This interpretation relates to the sociological concept of social capital, connections from social networks, which has been shown to play a significant role in youths' educations in studies by scholars such as James Coleman (1988).

Apply

In this test, I limit the sample for this analysis to individuals who responded to the question of whether or not they had applied to college and who were in 12^{th} grade at the time of the survey. I use maximum tax incentives for the survey year in my analysis. Finding a causal effect of the amount of the tax incentives on applying to college is dependent upon the assumptions that individuals or their families were capable of calculating the tax incentive they

would likely receive for the current survey year and that individuals used this information in their decision to apply to college for whatever year they intended to enroll. It is uncertain whether families were aware of changes in tax law that would impact the amount of subsidy they could receive or whether income shocks may have led to erroneous maximum benefit calculations.

The size of the changes in probability of applying appear economically small, implying a decrease in the probability of applying to college equivalent to .38 percentage points for an increase in $100 of tax benefits and a decrease of roughly 1 percentage point if one is eligible for some benefit greater than zero (using the probit models in Table 8). However, both variables are statistically insignificant. Approximately 66% of respondents are eligible for some form of tax incentive. This finding is rationale as many students likely do not know about the benefits as they do not do their taxes.

Notably, information about financial aid had a positive significant coefficient at the .1% level, with the probability that an individual will apply to college increasing by 27 percentage points if an individual or his or her family has knowledge of financial aid. It is possible that the individuals do not consider the tax benefits part of financial aid information or that individuals do not know about the tax incentives. This could explain the lack of significance for the tax incentives, despite the importance of financial aid. Similar to the enrollment interpretation, another meaning of the financial aid variable could be that individuals who planned to apply to college learned about financial aid while they planned for their future and/or learned about aid through knowledgeable individuals whose information and connections help respondents decide to apply to college.

Complete

These regressions checked whether the probability of completing at least a year of school is dependent upon the amount of tax incentive an individual was eligible for during the previous survey. This test is limited in that the amount of tax incentive for which an individual was eligible may have changed in the year between surveys. Timing is complex, as school years are different from calendar years. For example an individual may have completed a year of college in 1998 post-survey, 1999, or 2000 pre-survey, but the tax incentive is for the 1998 year. The entirety of the tax incentive is assigned to the first survey year in this design. This is potentially problematic for the case in which individuals completed school in the missing-odd-year/completion-survey-year as the tax incentive calculated may be quite different depending on changes in family income and changes in tax law; however there is likely a high correlation between maximum tax incentives for an individual over time. Of the full sample, approximately .25% of respondents completed at least one year of college multiple times, so this should not interfere with the calculation. These regressions cover tax incentive years 2000, 2002, 2004, and 2006, as other years have too few respondents.

The amount of tax incentive for which an individual is eligible is insignificant, utilizing maximums at program limits and a tax benefit eligibility variable (Table 9). Similar to the other decisions studied, the coefficients are negative, and the probability of completing a year of college decreases by roughly .27 percentage points (probit model) for an additional $100 dollars in benefit eligibility, while the probability of completing a year of college decreases by 1.8 percentage points if an individual is eligible for any benefit. These magnitudes appear to be fairly small, and they are statistically insignificant. However, the regressions also show that the probability of completing a year of college increase by approximately 17 percentage points if an individual has prior knowledge of financial aid. This may suggest that aid does play a role in

college completion, though this sample includes individuals who do not state that they have enrolled in college, so the effects could be limited solely to whether an individual enrolls in school. Limiting the sample to individuals currently enrolled in school yields a significant and positive coefficient for financial aid, but the sample size is fairly small, with only185 respondents. Therefore, it seems that prior knowledge of financial aid is significant for whether an individual completes a year of college, but this knowledge could also indicate more awareness of college and more serious preparation for college.

Control Variables

It is notable that across all dependent variables and all samples, frequency of discussion of college with parents and desire to complete at least 16 years of education are highly significant. For the "full" sample, the probability of enrolling in college increases by approximately 10 percentage points for individuals (Table 5) who report discussing attending college with their parents often. The probability of applying to college increases by approximately 22 percentage points (Table 8), and the probability of completing a year of college increases approximately 14 percentage points (Table 9) if an individual reports having spoken often with their parents about attending college. These increases are economically significant. Approximately 62% of enrollment respondents indicated often, 74% of applicant respondents, and 72% of completion respondents. This suggests that a high level of parental involvement, as perceived by the respondents, has a significant relationship with college decisions.

Additionally, the desire to complete at least 16 years of education is significant across dependent variables and samples. The probability of enrolling in college increases by approximately 13 percentage points if an individual wants to complete at least 16 years of education, likely equivalent to a bachelor's degree (77% of the sample). Individuals who want to

complete at least 16 years of education are about 80% of the sample for the application and completion samples. The probability of applying to college increases by approximately 15 percentage points if an individual wants to complete 16 years of, and the probability of completing a year of college increases approximately 17 percentage points. These results suggests that desire to continue with school motivates students to go through the college process.

Across the full samples, the probability of enrolling in college increases approximately 8 percentage points and probability of completing a year of college increases by approximately 13 percentage points if an individual is female. However, the probability of applying to college is unaffected. This discrepancy may imply that despite relative gender equality in applying to college, more women actually continue on to enroll.

Lastly, it is also notable that income is statistically insignificant for decisions of whether to apply to college and whether to complete a year of college. Multiple specifications for income were tested (not shown), including the logarithmic variable used in primary regressions, a linear term, quadratic term, and linear and cubic splines. Unfortunately, the apply dummy variable does not give information about the prestige of the institution to which individuals apply, which likely does differ by income according to Hoxby and Avery (2012). The findings of this paper suggest that while family income may not be a significant determinant in the decision to apply to college or complete a year of college, it is (statistically) significant in the decision to enroll.

VII. Conclusion

The sizes of the Hope Credit, Lifetime Learning Credit, and Tuition Deduction appear insignificant in determining the probability that an individual enrolls in college, applies to college, or completes a year of college. The appearance of weakly significant negative

relationships between the dependent variables and the amount of tax incentive for which one is eligible or for tax benefit eligibility is possibly a function of miscalculations of income that are biased toward zero or individuals in the linear phase-out range whom have relatively similar income but for whom a smaller tax benefit amount is a function of having slightly higher income, though differences in filing status likely lessen this effect. Estimates for tax benefits are imprecise, subject to noise from income estimates and from likely college spending for individuals.

Additionally, due to limitations to the data, I do not include a large number of individuals in a time period prior to the enactment of the education tax benefit laws who are of comparable income but do not qualify for any tax incentive . This reduces the variation of the amount of tax benefits for which an individual qualifies, which could contribute to insignificant and negative results, as the negative sign for the amount of tax benefit more likely reflects smaller amounts of income rather than the larger amounts of the tax aid, though differences in filing status minimize the correlation between income and the tax benefit.

Insignificant effects of the tax incentives may also be a result of including individuals who are not actually dependents of their mothers. However, virtually all included respondents had incomes below the poverty level or did not report income, so the likelihood that they are independent is low. Mothers might not actually pay for college as well, which would overestimate the value of the tax incentives. I do not control for this in my model. Federal financial aid for individuals under the age of 24 is set such that it is assumed that parents will contribute financially if they have sufficient income. FAFSA (Federal Student Aid) requires that individuals include parental income information with very few exceptions such as if the student is 24 or older, an emancipated minor, or has been homeless.

Information about financial aid is extremely significant for all college decisions studied. While it is uncertain whether individuals include information about the tax incentives in their definition of aid, these findings suggest that though individuals likely base their college decisions in part on the information they have about financial aid, aid relating to tax incentives does not appear to be significant in this study. Further investigation of this finding would be helpful, as policymakers have strongly emphasized these tax benefits in recent years, recently renewing and expanding the relevant policies. While the cost of college has been an increasingly significant barrier to entry for individuals, it appears that the amount of tax-based aid available to individuals has had no impact on college decisions. Financial aid policy changes in the form of student loan reform or other federal aid changes may be more effective. If the goal of the tax incentives is to help individuals afford college, it seems likely that other forms of aid are more effective, assuming individuals are aware of the tax benefits. An alternative explanation for the significance of the financial aid information dummy variable is that individuals who are more interested in attending college are more likely to plan ahead and receive financial aid information.

The statistical significance and large magnitudes of the discussion with parents of attending college variable suggests that throughout each step of the college process there is a strong relationship between the choices a student makes and the involvement of his or her parents in these decisions. It is also possible that in these discussions about attending college families were planning how to pay for college. At the very least, these individuals display some forethought in their future post-secondary endeavors, perhaps indicating that policies advocating planning ahead for college would increase educational attainment. Additionally, the variable relating to desired level of education tends to be extremely significant with large magnitudes,

suggesting that motivation to complete a certain year of schooling has a significant effect on the probability that an individual makes affirmative decisions related to attending higher education. These findings indicate that receiving information about college and financial aid as well as planning for achievement of post-secondary education are extremely important components in making college related decisions. Perhaps increased information about college planning that includes the tax benefits in financial aid costs will increase the effectiveness of the tax benefits, as families may not realize that they are an option until they do their taxes, well after they've already paid for schooling for the given tax year. Additionally, while difficult to formulate into policy, encouraging families to discuss college plans may increase educational attainment. Increased interaction between young adults and parents and/or individuals with financial aid information would likely leave young adults better informed of their options and help them find a feasible route to a college education.

Due to limitations of this dataset, there were many questions that could not be studied. Future studies analyzing the effects of the tax incentives on enrolling in public versus private higher education institutions and whether the extension of the Hope Credit into the American Opportunity Tax Credit affected college decisions would be useful. Additionally, research into whether policy efficiency differs between income groups eligible for these incentives would be useful.

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IX. Appendix

Table 4: Selected Summary Statistics: Full Samples

Variable	Total Sample	Enroll	Apply	Complete
Tax Benefit (1998 dollars)	739.20	744.50	822.60	777.60
	(25.67)	(28.71)	(36.69)	(28.90)
AGI (1998 dollars)	56331.00	56603.00	59289.00	58515.00
	(1020.00)	(1097.00)	(1918.00)	(1585.00)
% Who Received Aid Information	0.63	0.62	0.78	0.75
	(0.02)	(0.02)	(0.02)	(0.02)
% Who Spoke About College Often	0.61	0.60	0.74	0.73
	(0.02)	(0.02)	(0.03)	(0.02)
% Desiring At Least 16 Years of Education	0.76	0.76	0.82	0.81
	(0.02)	(0.02)	(0.02)	(0.02)
Female	0.47	0.47	0.50	0.49
	(0.02)	(0.02)	(0.03)	(0.02)
% Whose Mothers Completed More Than 12 Years of Education	0.43	0.43	0.46	0.46
	(0.02)	(0.02)	(0.03)	(0.02)
% Whose Mothers Were At Least 25 When Respondent Born	0.38	0.38	0.48	0.42
	(0.02)	(0.02)	(0.03)	(0.02)
Reading Comp. Percentile	51.00	50.77	53.18	54.09
	(1.20)	(1.33)	(1.42)	(1.15)
Math Percentile	56.19	56.18	60.93	59.14
	(0.90)	(0.99)	(1.49)	(1.24)
Age	19.55	19.76	17.36	18.24
	(0.05)	(0.06)	(0.03)	(0.06)
% With Married Mothers	0.69	0.70	0.76	0.73
	(0.02)	(0.02)	(0.02)	(0.02)
Year	2004	2004	2003	2003
	(0.15)	(0.16)	(0.14)	(0.11)
% (Dep Var: N/A Enrolled, Applied, Completed)	--	0.55	0.77	0.66
	--	(0.02)	(0.02)	(0.02)
Observations	4538.00	3731.00	414.00	705.00

The table reports weighted means, using a custom weighting variable constructed by the NLSY staff. Respondents can appear 1 to 3 times. Tax benefits and adjusted gross income are reported in 1998 dollars. The Total category refers to all eligible individuals in the sample whose incomes are between $10,000 AGI and $200,000 AGI (1998 dollars). The Enroll/Apply/Complete columns refer to individuals in the full sample who responded to questions for each respective dependent variable.

Table 5: Enrollment

Sample	Full	Full	Income Elig	Income Elig
Model	OLS	Probit	OLS	Probit
Tax Benefit (1998 dollars)	-0.00318*	-0.00325*	-0.00187	-0.00202
	(0.0014)	(0.0013)	(0.0020)	(0.0019)
AGI (1998 dollars)	0.0788***	0.0763***	0.119***	0.113***
	(0.0140)	(0.0135)	(0.0243)	(0.0225)
Received Aid Information	0.0849***	0.0858***	0.0806***	0.0785***
	(0.0176)	(0.0167)	(0.0210)	(0.0197)
Spoke About College Often	0.108***	0.104***	0.0901***	0.0861***
	(0.0184)	(0.0172)	(0.0223)	(0.0205)
Desire At Least 16 Years of Education	0.130***	0.127***	0.133***	0.126***
	(0.0202)	(0.0199)	(0.0251)	(0.0242)
Female	0.0783***	0.0767***	0.0852***	0.0818***
	(0.0165)	(0.0160)	(0.0197)	(0.0189)
Mother Completed More Than 12 Years of Education	0.0714***	0.0684***	0.0793***	0.0772***
	(0.0173)	(0.0164)	(0.0203)	(0.0192)
Mothers Were At Least 25 When Respondent Born	0.0791***	0.0749***	0.0954***	0.0894***
	(0.0212)	(0.0203)	(0.0261)	(0.0249)
Reading Comp. Percentile	0.00122***	0.00120***	0.00151***	0.00149***
	(0.0004)	(0.0004)	(0.0004)	(0.0004)
Math Percentile	0.00214***	0.00206***	0.00203***	0.00190***
	(0.0004)	(0.0004)	(0.0004)	(0.0004)
Age 19	-0.116***	-0.114***	-0.108***	-0.109***
	(0.0216)	(0.0220)	(0.0256)	(0.0265)
Age 20	-0.178***	-0.173***	-0.181***	-0.175***
	(0.0223)	(0.0215)	(0.0270)	(0.0260)
Age 21	-0.272***	-0.257***	-0.273***	-0.254***
	(0.0246)	(0.0225)	(0.0293)	(0.0263)
Age 22-23	-0.346***	-0.327***	-0.351***	-0.323***
	(0.0261)	(0.0227)	(0.0317)	(0.0272)
Year 1996	0.525***	0.400***	0.513***	0.404***
	(0.0555)	(0.0275)	(0.0657)	(0.0362)
Year 2000	0.239***	0.204***	0.272***	0.234***
	(0.0432)	(0.0350)	(0.0528)	(0.0411)
Year 2002	0.291***	0.246***	0.306***	0.260***
	(0.0429)	(0.0333)	(0.0511)	(0.0389)
Year 2004	0.294***	0.255***	0.285***	0.249***
	(0.0436)	(0.0346)	(0.0529)	(0.0421)

Year 2006	0.274***	0.238***	0.284***	0.247***
	(0.0448)	(0.0366)	(0.0544)	(0.0440)
Year 2008	0.210***	0.181***	0.227***	0.197***
	(0.0471)	(0.0407)	(0.0576)	(0.0486)
Constant	-0.862***	--	-1.337***	--
	(0.1440)	--	(0.2670)	--
Observations	3,731	3,731	2,523	2,523
R-squared	0.23	0.1867'	0.235	0.1912'

*** p<0.001, ** p<0.01, * p<0.1. Standard errors are clustered at the individual level. The probit model coefficients refer to average marginal effects. The value of the tax benefit is measured in hundreds of (1998) dollars. The full sample refers to all eligible individuals in the sample whose incomes are between $10,000 AGI and $200,000 AGI (1998 dollars). The income eligible sample refers to individuals with positive federal tax liability and AGI below $80,000 if respondent's mother is unmarried and $160,000 if respondent's mother is married. AGI refers to the logarithm of adjusted gross income in 1998 dollars. ' indicates psuedo R-squared.

Table 6: Enrollment Continued

Sample	Credit Elig	Credit Elig	>Credit Elig	> Credit Elig
Model	OLS	Probit	OLS	Probit
Tax Benefit (1998 dollars)	-0.00453*	-0.00437*	0.0076	0.00659
	(0.0022)	(0.0020)	(0.0048)	(0.0046)
AGI (1998 dollars)	0.142***	0.129***	0.132*	0.117*
	(0.0303)	(0.0272)	(0.0605)	(0.0484)
Received Aid Information	0.0796***	0.0776***	0.118**	0.110**
	(0.0231)	(0.0213)	(0.0414)	(0.0387)
Spoke About College Often	0.0859***	0.0810***	0.126**	0.120**
	(0.0242)	(0.0220)	(0.0458)	(0.0401)
Desire At Least 16 Years of Education	0.130***	0.124***	0.134*	0.107*
	(0.0269)	(0.0258)	(0.0567)	(0.0490)
Female	0.0695**	0.0658**	0.120**	0.115**
	(0.0218)	(0.0206)	(0.0387)	(0.0381)
Mother Completed More Than 12 Years of Education	0.0680**	0.0650**	0.141***	0.128***
	(0.0223)	(0.0208)	(0.0424)	(0.0375)
Mothers Were At Least 25 When Respondent Born	0.0863**	0.0768**	0.0883*	0.0858*
	(0.0291)	(0.0272)	(0.0490)	(0.0474)
Reading Comp. Percentile	0.00164***	0.00156***	0.000418	0.000636
	(0.0005)	(0.0004)	(0.0009)	(0.0009)
Math Percentile	0.00196***	0.00178***	0.00197*	0.00177*
	(0.0005)	(0.0005)	(0.0009)	(0.0008)
Age 19	-0.134***	-0.129***	-0.0206	-0.0303
	(0.0293)	(0.0291)	(0.0479)	(0.0525)
Age 20	-0.200***	-0.187***	-0.102*	-0.106*
	(0.0307)	(0.0290)	(0.0512)	(0.0498)
Age 21	-0.299***	-0.272***	-0.182**	-0.178***
	(0.0326)	(0.0287)	(0.0586)	(0.0535)
Age 22-23	-0.374***	-0.339***	-0.329***	-0.291***
	(0.0347)	(0.0296)	(0.0680)	(0.0513)
Year 1996	0.481***	0.380***	--	--
	(0.0700)	(0.0403)	--	--
Year 2000	0.280***	0.236***	0.482*	0.365**
	(0.0551)	(0.0415)	(0.2020)	(0.1330)
Year 2002	0.301***	0.251***	0.549**	0.420***
	(0.0538)	(0.0403)	(0.1910)	(0.1200)

Year 2004	0.320***	0.270***	0.418*	0.336*
	(0.0559)	(0.0420)	(0.1960)	(0.1550)
Year 2006	0.311***	0.265***	0.408*	0.319*
	(0.0573)	(0.0440)	(0.1980)	(0.1610)
Year 2008	0.230***	0.197***	0.444*	0.347*
	(0.0611)	(0.0502)	(0.2020)	(0.1570)
Constant	-1.528***	--	-1.840**	--
	(0.3300)	--	(0.7070)	--
Observations	2,062	2,062	581	581
R-squared	0.227	0.183'	0.2692	0.2284'

*** p<0.001, ** p<0.01, * p<0.1. Standard errors are clustered at the individual level. The probit model coefficients refer to average marginal effects. The value of the tax benefit is measured in hundreds of (1998) dollars. AGI refers to the logarithm of adjusted gross income in 1998 dollars. ' indicates psuedo R-squared. The Credit Eligible sample refers to individuals whose families have positive federal tax liability but are below the upper income limits for receipt of the education tax credits. The > Credit Eligible sample refers to individuals whose families have income exceeded the upper income limit for the tax credits.

Table 7: Enrollment: Alternate

Sample	Full	Full	Income Elig	Income Elig
Model	OLS	Probit	OLS	Probit
Eligible	-0.0254	-0.0269	0.0423	0.0352
	(0.0189)	(0.0187)	(0.0356)	(0.0332)
Observations	3,731	3,731	2,523	2,523

*** p<0.001, ** p<0.01, * p<0.1. Standard errors are clustered at the individual level. The probit model coefficients refer to average marginal effects. Eligible refers to individuals who have an educational tax benefit greater than zero. The Full category refers to all eligible individuals in the sample whose incomes are between $10,000 AGI and $200,000 AGI (1998 dollars). The income eligible category refers to individuals with positive federal tax liability and AGI below $80,000 if respondent's mother is unmarried and $160,000 if respondent's mother is married. The Eligible variable refers to a dummy variable representing eligibility for some tax benefit greater than zero.

Table 8: Apply

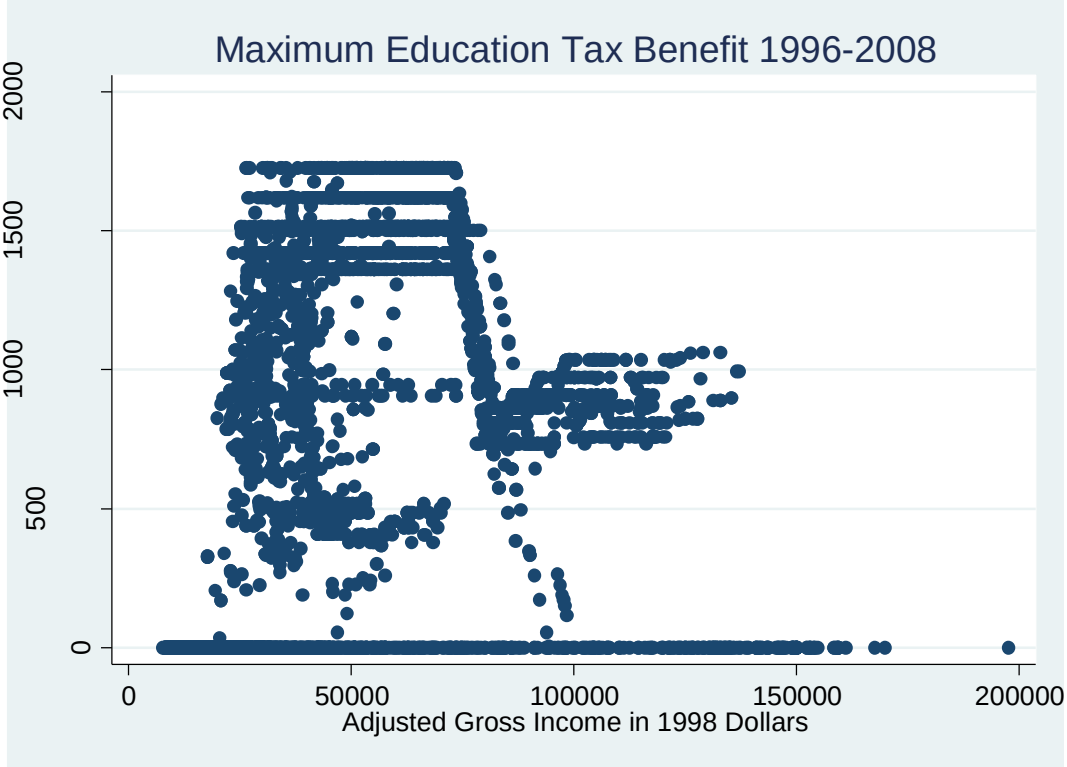
Sample	Full	Full	Full	Full
Model	OLS	Probit	OLS	Probit
Tax Benefit	-0.00253	-0.00381	--	--
(1998 dollars)	(0.0032)	(0.0037)	--	--
Eligible	--	--	-0.00099	-0.0106
	--	--	(0.0457)	(0.0513)
AGI	0.0283	0.0378	0.019	0.0258
(1998 dollars)	(0.0324)	(0.0377)	(0.0342)	(0.0388)
Received Aid	0.268***	0.271***	0.266***	0.268***
Information	(0.0555)	(0.0435)	(0.0553)	(0.0437)
Spoke About College	0.222***	0.216***	0.223***	0.217***
Often	(0.0518)	(0.0416)	(0.0518)	(0.0416)
Desire At Least 16	0.152**	0.146**	0.153**	0.146**
Years of Education	(0.0524)	(0.0464)	(0.0524)	(0.0464)
Female	0.0264	0.0249	0.0277	0.0277
	(0.0381)	(0.0406)	(0.0383)	(0.0408)
Mother Completed	0.0896*	0.115**	0.0902*	0.117**
More Than 12 Years of	(0.0384)	(0.0395)	(0.0384)	(0.0397)
Mothers Were At	-0.0266	-0.0404	-0.0273	-0.0422
Least 25 When	(0.0424)	(0.0480)	(0.0425)	(0.0484)
Reading Comp.	0.000618	0.00103	0.000586	0.00102
Percentile	(0.0009)	(0.0010)	(0.0009)	(0.0010)
Math Percentile	0.00141*	0.00167*	0.00142*	0.00166*
	(0.0008)	(0.0009)	(0.0008)	(0.0009)
Year 2002	0.034	0.043	0.0331	0.0448
	(0.0647)	(0.0575)	(0.0651)	(0.0581)
Year 2004	0.152*	0.173**	0.149*	0.171**
	(0.0626)	(0.0541)	(0.0628)	(0.0550)
Year 2006	0.154*	0.168**	0.152*	0.169**
	(0.0684)	(0.0579)	(0.0682)	(0.0584)
Constant	-0.268	--	-0.184	--
	(0.3360)	--	(0.3500)	--
Observations	414	414	414	414
R-squared	0.267	0.253'	0.265	0.2505'

*** p<0.001, ** p<0.01, * p<0.1. Standard errors are clustered at the individual level. The probit model coefficients refer to average marginal effects. The value of the tax benefit is measured in hundreds of (1998) dollars. AGI refers to the logarithm of adjusted gross income in 1998 dollars. ' indicates psuedo R-squared. The full sample refers to all eligible individuals in the sample whose incomes are between $10,000 AGI and $200,000 AGI (1998 dollars). The Eligible variable refers to a dummy variable representing eligibility for some tax benefit greater than zero.

Table 9: Completion of Year of College				
Population	Full	Full	Full	Full
Model	OLS	Probit	OLS	Probit
Tax Benefit	-0.00239	-0.00269	--	--
	(0.0029)	(0.0028)	--	--
Eligible	--	--	-0.0129	-0.0178
	--	--	(0.0403)	(0.0400)
AGI	0.0213	0.0233	0.016	0.0182
	(0.0276)	(0.0274)	(0.0293)	(0.0291)
Received Aid Info.	0.179***	0.173***	0.178***	0.171***
	(0.0414)	(0.0358)	(0.0414)	(0.0358)
Spoke About College Often	0.148***	0.141***	0.149***	0.143***
	(0.0424)	(0.0363)	(0.0424)	(0.0363)
Desire At Least 16 years of Education	0.180***	0.172***	0.180***	0.173***
	(0.0456)	(0.0408)	(0.0457)	(0.0409)
Female	0.126***	0.126***	0.127***	0.126***
	(0.0340)	(0.0313)	(0.0340)	(0.0313)
Observations	705	705	705	705
R-squared	0.23	0.192'	0.23	0.1913'

*** p<0.001, ** p<0.01, * p<0.1. Standard errors are clustered at the individual level. The probit model coefficients refer to average marginal effects. The value of the tax benefit is measured in hundreds of (1998) dollars. AGI refers to the logarithm of adjusted gross income in 1998 dollars. ' indicates psuedo R-squared. Additional control variables for age, year (2002, 2004, 2006), mother background, and PIAT percentiles were used. The full sample refers to all eligible individuals in the sample whose incomes are between $10,000 AGI and $200,000 AGI (1998 dollars). The Eligible variable refers to a dummy variable representing eligibility for some tax benefit greater than zero.

Graph 2


Maximum Education Tax Benefit 1996-2008
2000
1500
1000
500
0
0
50000
100000
150000
200000
Adjusted Gross Income in 1998 Dollars