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THE IMPACT OF FEDERAL TAX CREDITS FOR HIGHER EDUCATION EXPENSES

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ABSTRACT

The 1997 creation of the Hope and Lifetime Learning Tax Credits marked a dramatic shift in the way in which federal support for college expenses is distributed to students and their families. Unlike other aid programs, the tax credits have exceptionally broad eligibility requirements, and there is a significant delay between when a recipient enrolls in college and when they receive the benefit. When introduced, the projected benefits of the tax credits were $9.7 billion, over fifty percent greater than the total amount spent at the time on the Pell Grant, the primary Federal grant program. This study examines the impact of the tax credits on students, families, colleges, and states. Using several data sources, I analyze the distribution of the benefits and the effect on enrollment decisions and college pricing. Analysis of tax return data suggests that what was intended to be a transfer to the middle class did benefit families with incomes between $30,000 and $75,000 the most. Insufficient tax liability due to low income levels and the interaction of the credits with other aid programs prevents many low-income individuals from qualifying for a benefit. Additionally, many eligible students did not claim a credit, particularly those from minority groups. Further analysis finds no evidence of increased postsecondary enrollment among eligible students in spite of the stated goal to increase access to higher education. On the other hand, some states and public institutions appear to have responded to incentives to increase the prices of colleges at which students face a low marginal cost. However, the results of this analysis are mixed and less conclusive.

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1. INTRODUCTION

During the past several decades, changes in the American economy have favored college graduates, and a postsecondary degree has become increasingly important in labor market outcomes (Murphy and Welch, 1993; Juhn, Murphy, and Pierce, 1993). After accounting for inflation, the incomes of those with a Bachelor's degree grew 14.6 percent from 1975 to 1998 while those with only a high school degree experienced a 2.1 percent decrease.[1] As a result, access to higher education has become an important national issue with the federal government focusing its efforts on financial aid policies designed to help students afford college expenses. Programs have included grants, such as the Pell Grant, subsidies for working students, and loans like the Perkins and Stafford Loans. However, with the Tax Relief Act of 1997, the government introduced a new form of aid to college students — federal tax credits for higher education expenses. The passage of the Hope (hereafter referred to as HTC) and Lifetime Learning Tax Credits (LLTC) marked a shift in the manner that governmental support would be distributed to postsecondary students and their families.

When first introduced by former President Clinton during a June 1996 commencement speech at Princeton University, the tax credits were touted as a step towards making "the 13th and 14th years of education as universal to all Americans as the first 12 are today" (Greenwood, 1996). However, the proposal also reflected Clinton's intention to provide targeted tax relief to the middle class (Purdum, 1996). As a model for the proposal, Clinton used the Georgia HOPE Scholarship. This politically popular program had been instrumental in getting Governor Zell Miller re-elected by appealing to the concerns of middle class voters (Applebome, 1996).[2] In a similar fashion, Clinton set program earnings limits that targeted middle-income families and promoted the credits as a reward to students who worked hard in school. Furthermore, as a credit, the proposal was viewed to be more helpful to the typical middle

[1] Source: U.S. Census Bureau, March CPS.

[2] The Georgia Hope Scholarship provides full tuition, fees, and a book allowance to Georgia residents with a B average who attend an in-state public college. Those students choosing to attend an in-state private college are given comparably-valued compensation. Benefits were limited to families with less then $66,000 of income during the first year and $100,000 during the second year. Although the original tax credit proposal also included a GPA requirement, this criteria was eliminated before the policy was signed into law.

class family than a tax deduction (Purdum, 1996).[3] To justify the middle-income target, government officials assert that the tax credits serve a need since the middle-class makes up a large proportion of college participants but is excluded from other federal grant programs (Stoll and Stedman, 2001).

As with any other financial aid program, tax expenditures for higher education are considered a human capital investment expected to yield both private and social benefits including higher individual incomes, greater productivity, and lower crime rates and government dependency. However, the particular attraction of using tax credits rather than traditional grants or loans to promote college participation at least partly develops from the fact that federal budget rules favor tax expenditures over discretionary spending programs (Kane, 1999). As such, this was not the first time tax credits had been considered to support college costs. During the mid-1960s and early-1970s, Congress had considered a couple of proposals.[4] However, tax credits for higher education were finally passed during a time when the government sought to reduce taxes: the creation of the HTC and LLTC were part of the largest American tax cut in fifteen years (Gray, 1997). After years of debating incremental changes to other federal financial aid programs, the tax side of the budget served to dramatically increase support for postsecondary education.

According to the Department of Education (DOE), the credits are projected to eventually benefit 13.1 million students (5.9 million from HTC and 7.2 million from LLTC) at a cost of $9.7 billion.[5] As shown in Figure 1, this estimate is over fifty percent greater than the total amount spent at the time on the Pell Grant, the primary Federal grant program. It also exceeds the amount spent on each of the three largest primary and secondary education programs (Title I, Head Start, and the School Lunch Program). Furthermore, the expected size of the program is only 20 percent less than expenditures on welfare (TANF/AFDC). Although participation during the first three years of the program have not met the

[3] Deductions tend to disproportionately favor upper-income families since they are more likely to itemize their taxes.
[4] Former President Johnson defeated the tax credits proposal by creating the Guaranteed Student Loan program in 1965, and former President Carter counteracted with the Middle Income Student Assistance Act in 1978 (Hauptman and Rice, 1997).
[5] Source: Education Department estimates based on State-level enrollment, Pell Grant recipient data, and the President's fiscal year 2000 budget policy.

projections of the DOE, the total amount of tax credits has increased steadily each year from $3.4 billion in 1998, the first year of the program, to $4.9 billion in 2000, an increase of 44 percent.[6]

[FIGURE 1 ABOUT HERE]

The distribution of financial aid through the tax code is different from other forms of college assistance in several important ways. First, credits for tuition expenses in the current year do not accrue until the following year. Due to this timing, the delay between tuition payment and receipt of the tax credit could be up to 15 months.[7] This aspect of the program differs greatly from most other forms of aid, which are realized at the time of attendance, and this feature could have serious implications for how the aid affects college access. If the primary reason individuals do not enroll in college is due to liquidity constraints, the inability to secure present-day funding, then this aid is unlikely to increase access. For this reason, critics suggested that the credits would only benefit students expected to attend college regardless of aid rather than individuals on the margin of enrolling.

The timing of the tax credits also creates a disconnect between the aid and activity (college enrollment). This increases the likelihood that the tax credits will not be used for postsecondary expenses. If students do not internalize the future payment as aid for present-day college expenses, then when they receive the support a year later, the tax credit may be viewed as income to be spent on other expenses. In a similar fashion, the support is too late to influence the educational investments of students who have already graduated by the time they receive the credit.

On the other hand, the timing of the aid may also be a beneficial feature. Other forms of aid, particularly grants, might encourage individuals not well-suited for college to enroll since the person is not fully responsible for the expenses incurred. This is an adverse selection problem. The tax credits, however, are unlikely to encourage frivolous investments in higher education due to the delay in receiving the support. Furthermore, the disconnect between the aid and college enrollment might also prevent

[6] Calculations by author using data from the Internal Revenue Service, Information Services, Martinsburg Computing Center, Master File Service Support Branch.
[7] This assumes that tuition is paid in January of one year and taxes are filed in April of the following year (Conklin and Finney, 1999).

postsecondary institutions from responding in ways detrimental to students. Critics suggest that postsecondary institutions may respond to the increase in financial aid by raising their prices. Then again, due to the timing of the credits, colleges may be less likely to do this since students' present-day ability to pay has not increased.

A second important feature of tax credits is that there is no cap on the cost of the credits in terms of foregone tax revenue. Changes in individual behavior and/or state or institutional policy could quickly increase the estimated costs. For example, if a behavioral response to the program increased college enrollment significantly, there would be no limit to the amount of credits that could be claimed. Other governmental aid programs have experienced exceptional cost increases due to an unexpected response. For example, in New Mexico, the number of beneficiaries for the Lottery Success Scholarship so exceeded initial projections that the state was unable to meet the demand of students and benefits had to be reduced due to insufficient funds (Selingo, 1999).[8] Likewise, there is no similar budget constraint in terms of the higher education tax credits to limit the amount of benefits. Finally, since the higher education credits are tax expenditures, they are not subject to review in the annual Federal appropriations process or the periodic reauthorization most federal programs undergo. Therefore, the regular examination of federal financial aid programs by the government will not include this very large program (Conklin and Finney, 1999).

This paper examines the distribution and impact of the HTC and LLTC on taxpayers, students, and institutions. By reviewing the literature and analyzing several datasets on tax returns, individual behavior, and institutional activities, I examine three major questions. First, how have the tax credits been distributed by income? Have they really been a transfer to the middle class? Moreover, do a significant proportion of eligible families claim the credit or are the information and transaction costs of distributing aid through tax credits exceedingly high? While no program is likely to reach all eligible students, the higher education tax credits provide a new opportunity to test how effective it is to deliver

college aid through the tax system. Second, how have the credits affected the college decisions of individuals? Have they prompted individuals to attend college who would not have otherwise? Have the credits encouraged students to choose more expensive colleges? Finally, how have postsecondary institutions responded to the tax credits? Have they altered their pricing policies in reaction to the introduction of the federal aid? What role have state governments had in the actions of their public colleges and universities? While many studies have tried to predict the likely impact of these higher education credits, this will be among the first to use data since enactment to estimate the actual results.

The paper is organized in the following way. Section 2 describes the tax credits with information on recipient eligibility, the expenses covered, and other details. Section 3 examines how the benefits of the HTC and LLTC were distributed and whether most eligible families claimed a credit. Section 4 considers the effect the tax credits have had on student enrollment decisions. Section 5 analyzes the impact on postsecondary institutions and state policies. Section 6 summarizes the results and concludes.

2. A DESCRIPTION OF THE TAX CREDITS

Before 1997, subsidies for higher education through the tax system were limited to postsecondary expenses for employment-related training (Cronin, 1997). These expenses counted as an itemized deduction but did not cover training for the preparation of a new career. Additionally, the tax code allowed parents to claim exemptions for children up to the age of 24 if they were full-time college students and excluded interest on U.S. savings bonds redeemed to pay for tuition expenses. The only other special consideration given to higher education by the tax code was the exclusion of financial aid as income. This includes scholarship and fellowship income, Veteran's education benefits, and Employer-Provided Educational Assistance. However, the Taxpayer Relief Act of 1997 broadly expanded the treatment of higher education expenses with the Hope and Lifetime Learning Tax Credits. Table 1 summarizes the details of each credit.

[8] While the scholarship had 8,000 recipients in 1998-99, the total rose to 12,000 in 1999-2000, and was expected to be 16,000 the following year. In 2000-2001the $16 million in lottery revenue available to fund the scholarship was

[TABLE 1 ABOUT HERE]

The two tax credits complement each other by targeting different groups of students. While HTC may only be used for a student's first two years of post-secondary education, the LLTC is available for unlimited years to those taking classes beyond their first two years of college including college juniors and seniors, graduate students, and working adults pursuing lifelong learning.[9] For each credit, the expenses covered are tuition and required fees at an educational institution eligible for aid administered by the DOE. This amount is net grants, scholarships, and other tax-free educational assistance including Pell Grants, employer-provided education assistance, and Veteran's educational assistance. HTC provides a credit equal to 100 percent of the first $1,000 plus 50 percent of the next $1,000 of tuition paid during the tax year (a maximum credit of $1,500). The student must be enrolled at least half-time and pursue a degree or other recognized educational credential in order to be eligible for HTC. In contrast, individuals do not need to enrolled at least half-time or pursue an educational credential in order to be eligible for the LLTC thereby making the credit available to adults taking an occasional college course. The credit is equal to 20 percent on the first $5,000 of out-of-pocket tuition expenses (a maximum credit of $1,000), and beginning in 2003, the LLTC will cover up to $10,000 in expenses (a maximum credit of $2,000).[10]

Figure 2 displays how the benefits for each tax credit compare to college expenses. For each amount of qualified tuition expenses noted on the x-axis, the solid lines trace to the amount of the tax credit on the y-axis. The dashed lines denote the mean costs of different types of colleges to highlight the amount of credit that would be received at that type of school. The average cost of a public, two-year college during the 1997-98 school year would yield a $1,284 HTC or $313 LLTC benefit. The average

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insufficient to cover the $21.6 million in costs.

[9] To be eligible for HOPE, an individual must not have completed the first two years of college before the beginning of the tax year in question. Regardless of whether a student was full- or part-time, one may only take HOPE for two years. HOPE also requires that the student not have a felony drug conviction.

[10] Several criteria originally included in the proposal were eliminated before enactment (Cronin, 1997). This includes indexing the credit to inflation and requiring students to maintain a B-minus average in order to receive the HOPE. Additionally, the original proposal also allowed adults to deduct up to $10,000 per year ($5,000 in 1997 and 1998) for those enrolled at least half-time or for courses to improve job skills.

costs of other types of schools would yield the maximum credit.[11] HTC may be claimed on payments made after December 31, 1997 for college enrollment after that date while the LLTC could be claimed on expenses incurred as early as July 1, 1998 for college or vocational school enrollment beginning on or after July 1, 1998. Families are able to claim the Lifetime Learning tax credit for some members and the Hope credit for others in the same year. However, the same student cannot take both credits.

[FIGURE 2 ABOUT HERE]

The benefits of the tax credits phase out for higher-income taxpayers. The phase out begins at an adjusted gross income (AGI) of $80,000 for a joint return ($40,000 for single filers) with no benefit for families with incomes above $100,000 ($50,000 for single filers).[12] With these relatively high thresholds, tax credits for higher education expenses have the most extensive eligibility of any federal program. Data on tax returns from 1997 suggest that two-thirds of returns during that tax year would have been eligible based on filing status (joint or single) and AGI ($10,000 to $100,000 for joint filers; $10,000 to $50,000 for single filers).[13] In comparison, Pell Grants are strictly limited to families with incomes below $40,000. Nearly 90 percent of Pell Grant funds are awarded to families with incomes under $30,000 and 54 percent of those families have incomes under $10,000 (Kane, 1999a).[14]

3. THE DISTRIBUTION OF THE TAX CREDITS

The first major question that needs to be answered to understand the effect of the HTC and LLTC is how have the benefits have been distributed? Which groups have benefited the most from the credits? Is the policy progressive or regressive? As intended by Clinton, have middle-income families been the

[11] For the 1997-98 school year, the mean tuition cost (enrollment weighted) for a public, two-year college was $1,567, $3,111 for a public, four-year college, $7,079 for a private, two-year college, and $13,785 for a private, four-year college. Source: College Board (2001b).

[12] AGI is total income minus deductions for items such as alimony, student loans, IRAs, and medical savings accounts. For most taxpayers, AGI is equal to total income. In 1998, only 17.6 percent of returns had any of the above deductions. The average deduction adjusted their AGI calculation by $2,343 (Campbell, Parisi, and Balkovic, 2000).

[13] Source: Internal Revenue Service, Information Services, Martinsburg Computing Center. The proportion of the population eligible based on AGI might be higher since presumably some married persons filed separately when they might have been eligible had they filed jointly.

largest beneficiaries of the tax credits? This section examines these issues using data from the Internal Revenue Service for 1998, 1999, and 2000, the first three years of the tax credits. Furthermore, I investigate the extent to which eligible families have claimed a benefit.

3.1 Factors that Influence the Distribution of Benefits

From the first announcement of the tax credit proposal, many have hypothesized about the potential distribution of benefits based on the policy's criteria. One important feature of the tax credits is that they are not refundable. To receive a benefit, individuals must have income sufficient to produce positive federal income tax liability. Furthermore, if a family claims other tax credits or deductions, then this will reduce its ability to benefit from HTC or the LLTC.[15] Therefore, many lower-income groups are ineligible to receive a tax benefit (Kane, 1997; McPherson and Schapiro, 1997). This fact, coupled with the income caps that prevent individuals from the most affluent backgrounds from collecting the credit, suggest that the tax credits primarily benefit students from middle- and upper-income families.

The middle-class nature of the tax credit is confirmed when consulting the federal tax forms. A dependent student from a married family of four needs at least $17,900 in family income to overcome the standard deductions and exemptions necessary to have tax liability.[16] To receive the maximum LLTC ($1,000), this student's family income must be at least $24,550, or $27,900 to receive a maximum HTC ($1,500). This suggests that the bottom 30 percent of the 1997 income distribution was ineligible to take the full HTC benefit due to insufficient tax liability based on the benchmarks of a dependent student.[17] Beginning in 2003, the maximum LLTC will increase to $2,000 dictating that families must make at least

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[14] Eligibility for Pell depends on an individual's Expected Family Contribution, which is a function of income and expected college costs.

[15] Other tax credits reduce a family's tax liability dollar-for-dollar. Likewise, tax deductions reduce a family's AGI, the basis on which tax liability is calculated.

[16] This calculation is for the minimum income possible using the 1998 standard deduction for a "Married filing jointly" return ($7,100) and the exemption amount ($2,700 multiplied by the number of exemptions for incomes below $93,000). The minimum will be higher if a family itemizes deductions or takes a credit for dependent care expenses (line 41), elderly or disabled (line 42), children under age 17 (line 43), adoption (line 45), or foreign taxes (line 46). See Form 1040 for 1998 for more details.

[17] The income distribution calculations were made using data on the U.S. income quintiles and median from the U.S. Census Bureau (1999) "Current Population Reports, P60-200".

$31,250 to receive the full credit.[18] The bottom thresholds are lower for independent students due to a smaller standard deduction and less exemptions.[19] Independent students must have an income of at least $6,950 to have some tax liability, $13,600 to be eligible for the full LLTC, and $16,950 for the full HTC. Due to the income phase-out of eligibility the top 20 percent of the 1997 income distribution would have been ineligible to take either the full or any credit. For single filers, the cutoff is even lower making an even larger portion of the distribution ineligible.

Due to other features of the tax code, even eligible middle-income families may not be able to reap the full benefit of the tax credits. Claiming the HTC could subject many middle-income families to the alternative minimum tax (AMT). Although it was designed to ensure that wealthy taxpayers who shelter their incomes from taxation pay a minimum amount, Knight (1997) suggests that families with incomes as low as $41,350 might be penalized and not receive the full benefit of the credit. In an article for *The Washington Post*, Crenshaw (1997) calculated that a family earning $64,100 per year with two kids in college would normally pay $6,743 in taxes if filing jointly. If the family claims HTC for one and LLTC for the other (total $2,500), their tax liability would be reduced to $4,243. However, under the AMT calculation, the family's tax liability is $4,966, a $723 reduction in the value of the tax credits.

A second important determinant of the distribution of benefits is the amount of tuition expenses incurred by different groups. Therefore, the distribution of benefits is affected by where individuals attend college. Because low-income students tend to be concentrated at lower-priced colleges, such as public two-year and four-year schools, their likelihood of receiving the full tax benefit is further reduced. In addition, since the credit is based on tuition expenses net grants, the HTC and LLTC interact with other forms of financial aid. Most notably, this includes the Pell Grant, a means-tested federal aid program for students without a baccalaureate degree. Using the mean tuition levels of different types of colleges,

[18] A return's taxable income must be at least $6,650 for a tax of $1,000, $10,000 for a tax of $1,500, and $13,350 for a tax of $2,000. See the 1998 IRS Tax Table.

[19] A student is defined as "Independent" if he meets one of the following criteria: is over the age of 24; a veteran; an orphan or ward of the court; a person with legal dependents other than a spouse; married and not claimed by his parents; or a graduate student and not claimed by his parents. A single, undergraduate student may be designated as independent if he are not claimed as a dependent by his parents and has been self sufficient for at least two years.

Hauptman and Rice (1997) estimate that families with incomes below $20,000 will be eligible for the Pell Grant but not the tax credits.[20] Therefore, the interaction between the Pell Grant and higher education tax credits further raises the income benchmarks necessary for many individuals to claim the HTC or LLTC. According to figures from the U.S. Census Bureau, this benchmark makes the bottom twenty percent of the income distribution ineligible. Among female-headed households, half would not qualify for a tax credit.[21] In contrast, families with incomes of at least $50,000 would only be able to receive tax credits. Families between these benchmarks receive a combination of the two types of aid depending on the Pell Grant award and college price.

The most important criterion is, of course, college attendance. Since attendance rates differ by income and race, it is clear that the distribution of benefits is unlikely to be equal across groups even without the importance of the factors discussed above. Among dependent students age 18 to 24, only 38.3 percent with family incomes in the bottom quartile participated in college in 1997. In contrast, 78.5 percent of dependent students in the top quartile attended college (Jamieson, Curry, and Martinez, 2001). However, since one goal of the credits is to encourage participation in higher education, the incidence of the HTC and LLTC depends on their impact on college enrollment. If they encourage postsecondary attendance for certain individuals or groups, the relative benefits by income group or state could change. This possible effect is investigated in Section 4.

[TABLE 2 ABOUT HERE]

Based on these criteria, Table 2 displays the proportion of college students that are eligible for a higher education tax credit using data from the 1999-2000 National Postsecondary Student Aid Survey (NPSAS), a nationally-representative survey of students. Eligibility for a credit was determined using information on family income, attendance intensity (fulltime, parttime, or less than parttime), tuition expenses, and year in college. Assuming that the 1999-2000 school year is representative of any tax year,

[20] This assumes full-time enrollment by a college freshman from a married family of four.
[21] The median income of female-headed household in 1997 was $21,023. Source: U.S. Census Bureau (1999) "Current Population Reports, P60-200."

43 percent of undergraduates are eligible for either a HTC or LLTC.[22] Over half of masters and doctoral students are eligible. By college type, the greatest proportions of eligible students are at four-year colleges and proprietary schools (four-profit, two- and four-year institutions). When limiting the sample to full-time students, the proportion eligible increases. Nearly 56 percent of full-time undergraduates are eligible for a tax credit. Further analysis shows that removing the requirement for net tuition expenses would increase the percent eligible for a credit by nearly a third.[23] Although students who have no tuition net aid may still have living expenses, they do not qualify for a tax benefit.

While there are myriad of criteria that need to be satisfied in order to qualify for a tax credit including income benchmarks, college attendance, and positive net tuition expenses, an especially large number of students are still eligible for a benefit. This is especially true in comparison to other financial aid programs. For example, only approximately one-fifth of students in the NPSAS were eligible for the Pell Grant.

3.2 Credit Beneficiaries by Income: The IRS Data

Due to the time delay associated with data, little analysis has been done nationally on the actual beneficiaries of the tax credits. The few studies found to use actual data on credit usage (rather than assumed usage) focus on the University of California (UC) system. Hoblitzell and Smith (2001) examine usage of the credits by evaluating data collected on nearly 3,500 students. They find that more than 45 percent of families that claimed a tax credit earned less than $50,000 per year, and 22 percent earned less than $20,000 annually. The estimated aggregate amount in tax credits ($80 million) was about 85 percent of the $95 million UC students receive in Pell Grants, the largest federal grant program. Among the 1,282 undergraduate students, 13 percent claimed HTC (with a mean of $1,119 and 52 percent claiming the maximum) and 14 percent claimed the LLTC (with a mean of $661 and 28 percent claiming the maximum). Of the 543 graduate students in the survey, 32 percent claimed the LLTC (with a mean of $743 and 43 percent claiming the maximum). However, students in the UC system tend to be more

[22] Eligibility is measured with some error because it is defined by income rather than AGI.

affluent than the general population of college students. While the median income of respondents to the UC survey was $48,670 in 1999, the median U.S. income was $41,994 (U.S. Bureau of the Census, 2000). Furthermore, Hoblitzell and Smith estimate that only 37 percent of UC students were eligible for the credits in 1999. These differences make the Hoblitzell and Smith study difficult to generalize for the nation as a whole and for the population of college students.

To give a national picture of the number of families benefiting from the higher education tax credits, this study uses data on tax returns from the Internal Revenue Service. The number and amount of credits taken are shown for the first three years of the program in Tables 3a, 3b, and 3c.[24] During tax year 2000, nearly 6.7 million credits were claimed amounting to almost $4.9 billion. Over five percent of returns claimed either the HTC or LLTC, and the mean tax credit was $731. Comparing these figures to those from the two previous tax years, it is evident that usage of the credits has grown. While the mean has remained stable ($726 to $731), the number and total amount of credits grew 44 and 45 percent, respectively, from 1998 to 2000. Most of this growth occurred between the first and second year of the credits (1998 to 1999). Experience with other federal benefit programs suggests take-up rates will continue to increase. Participation in the Earned Income Tax Credit, another benefit program that is distributed through the tax system, continued to grow from 70 percent in 1984 to an estimated 80 to 86 percent in 1990 even after a number of policy changes (Scholtz, 1994).

[TABLES 3A, 3B, AND 3C ABOUT HERE]

While many families claimed a higher education tax credit, not all were able to take the full credit for which they were eligible due to insufficient tax liability. This happened when families did not have enough income, minus tax deductions, to generate enough tax liability, net other credits. These returns are defined as "nontaxable." Unless a family's tax liability is exactly equal to the amount they claimed in education tax credits, these nontaxable returns indicate the number of returns that were unable to take the entire education credit due to insufficient tax liability, perhaps in conjunction with the use of other credits.

[23] Without the requirement of positive net tuition expenses, 66.5 percent of undergraduates and 77.0 percent of master's and doctoral students would be eligible for a credit.

In general, 44.0 percent of all returns with AGIs between $5,000 and $100,000 were designated as "nontaxable" due to taking some tax credit in 1999. The mean is slightly larger for returns that claim education credits (46.0 percent).[25] This means that half of the higher education tax credit beneficiaries were not able to take the full credit for which they were eligible.

Use of the HTC and LLTC varied considerably by AGI. As discussed above, almost no individual below $10,000 claimed a credit (one percent) due to insufficient tax liability and the interaction of the tax credit with other forms of aid. In contrast, 7.3 percent returns with an income between $30,000 and $50,000 claimed an education credit while 8.5 percent of families with incomes between $50,000 and $75,000 received a benefit. This pattern is also likely to be a function of the different types of families in each AGI group (single adults versus parents with children old enough to be in college). Individuals with incomes between $50,000 and $75,000 claimed the largest average credit ($902).

Not all taxpayers correctly claimed an education tax credit. Although they are not eligible for the higher education tax credits, in tax year 2000, 2,965 credits were claimed by returns with over $100,000 in income.[26] Experience from the Earned Income Tax Credit suggests that possibly many more families improperly claimed the credit. Holtzblatt (1991) and McCubbin (1999) found that a significant fraction of taxpayers received the EITC when not technically eligible. Taxpayers will adopt a strategy by weighing the tradeoff between the benefit to misreporting income or expenses and the corresponding risk of detection and penalty (Allingham and Sandmo, 1972). However, since the higher education tax credits are not refundable like the EITC, the number of improper claims will be limited to those with sufficient tax liability.

To get a sense of the distribution of costs (tax liability) and benefits (tax credits) by income, the bottom two rows of Table 3a display the proportion of credits an AGI group claimed divided by the proportion of returns under $100,000 submitted by that group. Stated another way, this is an AGI group's

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[24] Note that these figures are before returns have been audited.
[25] Calculations by author using IRS data in Campbell and Parisi (1999). Nontaxable returns are defined as having no tax liability after all credits and the alternative minimum tax is applied.
[26] These returns are not included in the subsequent analysis.

share of benefits divided by its share of the tax burden. Using the number of returns and credits, families with an AGI between $20,000 and $29,999 had the same proportion of the education credits as they did returns. Families with incomes below this amount claimed relatively fewer credits while returns with higher AGIs claimed a larger share of credits than their proportion of the tax returns. This suggests that usage of the credits is skewed towards higher incomes. However, when comparing the total monetary amount of credits claimed to the tax liability for the group, the result reverses. Families with AGIs below $50,000 claim relatively more in higher education credits than they pay in taxes.

Instead of comparing across income, Tables 4 and 5 compare the benefits of the tax credits to federal tax liability within an AGI group. The last row in Table 4 compares the total amount in tax credits claimed by a group to its total federal tax liability. For example, for all returns, the total monetary amount in higher education tax credits was 0.5 percent of the total federal tax liability of returns for the 2000 tax year. The percentage ranges from 0.7 to 3.8 for groups eligible for the tax credit suggesting that the national mean (0.5 percent) is heavily skewed by individuals with over $100,000 in income. The amount of tax credits claimed when compared to tax liability is largest for individuals with an AGI between $10,000 and $19,999. The benefits were nearly four percent as large as the group's total tax liability. Likewise, the total amount in credits was 2.3 percent of the total tax burden for returns between $20,000 and $29,999. This ratio is smallest for families with incomes above $50,000.

[TABLE 4 ABOUT HERE]

Table 5 makes the same comparison but instead uses the mean credit (for returns with a credit greater than zero) and tax liability. For example, returns between $10,000 and $19,999 had on average $1,056 in federal tax liability. Moreover, those that claimed a credit in that group received an average benefit of $621. This suggests that the mean amount of tax benefits from the HTC and LLTC covered 58.8 percent of the tax liability for members of this group that claimed a credit.[27] This ratio is lower for

[27] This calculation implicitly assumes that returns which claim education credits have the mean characteristics of their AGI group.

groups with higher AGI. In summary, the credit covers more of the tax liability of low-income claimants than that of individuals with higher incomes.

[TABLE 5 ABOUT HERE]

In order to fully understand the incidence of the tax credit, it is necessary to consider the federal tax liability of a family over time. Using the earnings profiles estimated with CPS data by Murphy and Welch (1990), I approximate that individuals with twenty years of work experience (about the age to have college-age children) earn about 33 times that amount over the course of their working life.[28] Therefore, federal tax liability was multiplied by this number to get a return's lifetime tax burden. Furthermore, families are likely to receive the education credit for multiple years, and perhaps for multiple children. Assuming a family has two children that attend college for four years each, the mean education credit was multiplied by eight. The results of these calculations are shown in the last several rows of Table 5. For families that earn less than $20,000, the tax credits (under the above assumptions) make up about 14 percent of their lifetime tax liability. The percentage is less than one-third of that for returns with incomes above $30,000. For example, the total amount of education credits taken by a family with an AGI between $50,000 to $74,999 would only amount to 3 percent of its lifetime tax liability. However, this rough calculation is not a good approximation for low-AGI returns if the taxpayer is actually a student. In this case, the incomes and tax liabilities are extremely likely to grow over time, and the assumption of multiplying by 33 will not be accurate.

3.3 The Distribution of Credits across States

The distribution of education credits not only varies across income groups. States varied in the amount by which they benefited from the tax credits. To determine which states have reaped the most in credits, the 2000 data was analyzed by state. Table 6 displays the number and amount of credits claimed by state. While the mean credit claimed by state is similar to the national mean, there was incredible variation between states. The mean credit for a state ranged from $552 (New Mexico) and $899 (Pennsylvania). When compared to the DOE projections, further dissimilarities become evident. States

like New Jersey claimed 83 percent of the expected amount in tax credits during the third year of the program. Meanwhile, District of Columbia had less than a quarter of the expected credits.

[TABLE 6 ABOUT HERE]

A number of state characteristics are likely to affect the degree to which it benefited from the introduction of the higher education tax credits. The earnings distribution of its residents will determine the proportion eligible by income. The relative size of its population of college-age individuals and the rate of postsecondary attendance will also affect usage of the credits. Finally, since the HTC and LLTC are awarded based on net tuition expenses, the cost of the colleges a state's residents attend will be influential.[29] When comparing the ranking of the states, states with a larger proportion of returns claiming higher education tax credits did on average have a larger proportion of their population in college and higher mean public two-year tuition levels. States with the smallest percentage of returns with a credit had the largest mean proportion of eligible returns as determined by AGI, but a fewer proportion of residents enrolled in college and a lower average tuition price at its community colleges. The efforts of state governments and colleges to inform their students of the tax credits could also help explain differences in usage. For example, as discussed by Hoblitzell and Smith (2001), the UC system has actively tried to inform students and parents about the availability of the credit.

3.4 Are Eligible Families taking the Credit? The NHES and NPSAS Data

Although many families are eligible for the aid, this does not necessarily mean that they will claim the tax credit. This may be due to a lack of information about the benefit or a complicated claiming procedure. It is clear from the results in the previous section that usage of the credits is well below DOE projections. The Federal Office of Management and Budget provides additional support for this notion that many eligible families did not claim the HTC or LLTC. During tax year 1998, they found that only

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[28] This assumes individuals work for forty years. See the diagrams in Murphy and Welch (1990).

[29] For most students, this will be the cost of an in-state college. Eighty-one percent of first-time freshman in 1996 attended an in-state college. The proportion is higher for older students including undergraduate upperclassmen, graduate students, and nontraditional students. Source: U.S. Department of Education, National Center for Education Statistics, Integrated Postsecondary Education Data System (IPEDS), "Residence of First-Time Students" survey, 1996.

36 percent of families with eligible college students claimed the credit. That yielded 49 percent of the eligible amount to be claimed (Riley, 2000).

Since there has been considerable growth in the number and amount of credits claimed since inception, part of this gap could be due to families slowly learning about the aid. However, during tax year 2000, the third year of the policy, of the 13.1 million projected recipients, only 6.7 million returns claimed a credit. Since one return can claim multiple credits (e.g. a HTC for one child and a LLTC for another), it is better to compare the projected and actual amount of credits claimed. Although the DOE expected that $9.7 billion in credits would be awarded, returns only claimed $4.9 billion in credits, 50.5 percent of the projected amount. Previous studies have also found that individuals eligible for other types of financial aid programs do not necessarily apply (Orfield, 1992). As with any financial aid policy, awareness of the subsidy is essential to having the desired impact. Moreover, differing take-up rates by background affects the relative distribution of its benefits.

To further comment on the general level of awareness about the credits and the proportion and characteristics of eligible families that claimed a benefit, this study consulted two national datasets. The first, the National Household Education Survey (NHES), asked 8,552 parents in 1999 if they had ever heard about the HTC or LLTC.[30] As shown in Table 7, most parents were not aware of the credits. While one-third had heard of one of the credits, only 21.5 and 18.7 percent had heard of the HTC and LLTC, respectively. The responses by demographic characteristics allow one to draw some inferences about how awareness of the tax credits differed by background.[31] In general, parents from racial minority groups were less likely to know about the credits than white parents, particularly in the case of the LLTC. Additionally, awareness of the tax credits increased by household income and parent's level of education. Finally, parents with children closer to college age were more aware of the existence of the tax credits

[30] The NHES is a random-digit dialed, computer-assisted telephone survey covering all 50 states and the District of Columbia. It was conducted in January through April of 1999 by the National Center for Education Statistics. Source: National Center for Education Statistics (n.d.) Retrieved January 2003, from http://nces.ed.gov/nhes/Main/design.asp

than parents with younger children. While differences existed between groups, in no case were over 40 percent of the parents cognizant of the availability of the tax credits.

[TABLE 7 ABOUT HERE]

The 1999-2000 National Postsecondary Student Aid Survey (NPSAS) allows for a more detailed analysis of the characteristics of eligible students and families that did and did not claim a credit. It provides information on whether a student (or his or her family if the student is a dependent) claimed a higher education tax credit in 1999. Students were asked in a computer-assisted telephone interview if they or their parents had claimed a tax credit. Students who answered "don't know" were dropped from the sample. If the usage of the tax credits varies by the characteristics of eligible families, then this could explain why some groups did not benefit as much as projected. Furthermore, differences could foreshadow how the distribution of the credits would change if efforts were made to increase awareness about the credits for certain groups.

Table 8 examines the usage of tax credits among eligible students. Unfortunately, the NPSAS does not allow one to perfectly determine tax credit eligibility because income and net tuition information are provided for a school year (1999-2000) while eligibility for a credit is determined by a tax year (January to December). Given the way the variables are defined, I do not know how much of a student's tuition expenses were actually incurred during 1999 as opposed to the year 2000. Furthermore, I have no information about expenses incurred during spring 1999. To set a bound on this problem, two definitions of eligibility are utilized. The first uses information on family income, attendance intensity (fulltime, parttime, or less than parttime), enrollment during fall 1999, and year in college. However, it does not exclude students according to their net tuition expenses. Therefore, the first definition may be include students who did not have expenses that qualified for a higher education credit during 1999, and as such, the calculations may overestimate the number of students eligible for a benefit. On the other hand, while some students may not have had net tuition expenses during the fall 1999, it is possible that, unbeknownst

[31] To produce reliable estimates for racial groups, the NHES oversamples black and Hispanic individuals. While the dataset provides weights to make the sample nationally representative, because the tax questions were only asked for

in the data, they did have expenses during spring 1999 and so did qualify for a credit. The second definition drops individuals with zero net tuition expenses, but as stated above, this definition may exclude students who did have qualified expenses during spring 1999.[32]

[TABLE 8 ABOUT HERE]

Table 8 displays credit usage by demographic and college group. In general, less than one-third of eligible college students claimed either credit during the second year of the program. There were differences in the proportion that claimed a credit by background. A much larger percentage of independent students claimed a credit than dependent students. Relatively more female students claimed a benefit than their male counterparts, and more White students claimed credits than Black, Hispanic, or Asian students. In terms of college level, the highest take-up rates were at four-year public or private institutions, but the percentage that claimed a credit was still quite low.

Table 9 examines differences in the use of the credits using regression analysis. Logistic models were run on different sample of students.[33] Odds ratios are displayed and should be interpreted as the multiple by which that group was likely to claim a credit in comparison to the baseline group. Values less than one suggest the group was less likely to claim a credit. Specifications 1 through 3 use eligibility definition 1 while specifications 4 through 6 use definition 2.

[TABLE 9 ABOUT HERE]

As suggested by the descriptive results, all else equal, eligible female students and white students were more likely to claim a credit than men or other racial groups. Usage of the credits was also higher among families in which the heads of the household were married (the parents for dependent students and

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a subset of the sample, they are not used in this analysis.

[32] The percentage of the student population eligible for a credit using the second definition (excluding students with zero net tuition costs) is shown in Table 2. While 43 percent of undergraduates were found to eligible for a credit under this definition, when students with zero net tuition expenses are included, two-thirds of undergraduate students would be eligible. Likewise, including students with zero net tuition expenses increases the percentage eligible by about 23 percentage points for Master's, Doctoral, and other graduate students and five percentage points for graduate students in professional fields.

[33] The analysis does not use the weights provided by the sample because it has been altered by dropping the following: international students; students who did not know if they used the credit; students not enrolled in fall 1999 (it is unclear whether they were enrolled at all during 1999 to be eligible for a credit); and those who are not eligible according to their income or attendance pattern.

the students themselves if they were independent). Although results from the NHES suggest awareness of the tax credits increased with income and parents' education, there is little evidence to support this notion with the NPSAS. Dependent students with a parent who had some college were more likely to claim the credit than those with a parent who had a high school degree or less. However, a similar effect was not found for students who had a parent with a college degree. Likewise, the families of undergraduate students with greater expected family contributions were not more likely to claim a credit and less likely to do so among graduate students.

Given the differences that do exist in who used the credit by background, increases in awareness of the tax credits could affect the relative distribution of its benefits. For example, if minority groups who tend to be lower-income backgrounds were to increase their rates of usage, the overall distribution picture would shift towards lower-income families. However, many upper-income families appear to have not claimed credits they were eligible for, and so if their awareness increases, the distribution of the credits could relatively favor middle and upper-income families even more in the future.

3.5 Summary of the Distribution of Benefits

As suspected by many researchers, primarily middle-income individuals and families claimed the education tax credits. Nearly half of the credits claimed in 2000 were by returns with an AGI between $30,000 and $75,000 although this group makes up only 35 percent of the eligible returns. A report from the Congressional Research Service acknowledges that the credits were enacted to "preserve and enhance" access for middle and upper-middle income families (Stoll and Stedman, 2001). Nonetheless, when the amount in credits is compared to federal tax liability, the greatest beneficiaries are those with incomes between $10,000 and $30,000. From the number of nontaxable returns, it is also clear that many families did not have sufficient tax liability to claim the full credit for which they were eligible. It is important to note, however, that the tax credits may become more progressive with time. The income phase-out levels are defined in nominal dollars, and there is no provision to index the benchmarks to inflation or changes in income. Therefore, greater numbers of upper-income families will become ineligible for a tax credit with each year. Moreover, the relative distribution may change as families from

different backgrounds become more aware of the benefit.

With the intended goal of preserving and increasing access to college in the midst of rising costs, it is important to evaluate the effects of the HTC and LLTC on student college behavior. The next section considers whether the tax credits had any affect on college enrollment or whether the aid was just a transfer to the middle class without an effect on attendance.

4. EFFECTS OF TAX CREDITS ON STUDENT BEHAVIOR

With the introduction of the HTC and LLTC, government officials expressed a desire to increase access to higher education, especially for the first two years. While it has been found that the tax credits help to subsidize the educational costs of families in the middle-income brackets, the next question is whether this support increased college attendance as intended. The credits could affect postsecondary enrollment in several ways. First, they may encourage individuals to attend college who would not have otherwise thereby increasing total enrollment. Additionally, the credits could induce infra-marginal students, those who would have attended college regardless, to increase their expenditures on postsecondary education. This could come in the form of attending a more expensive college, enrolling full-time rather than part-time, or completing more years of education. However, these possible effects are mitigated by the findings in the previous section that few parents are aware of the credits and that many eligible students do not claim a benefit.

Although numerous studies have examined the effect of changes in financial aid policies, none of the existing literature is based on tax credits for higher education or anything similar. As such, this study is among the first to analyze how tax credits for higher education expenditures affected the college enrollment decisions of individuals. This section begins by reviewing the literature on the effects of financial aid on enrollment and discussing the possible effects of the tax credits on enrollment. Then it examines some of these issues using data from the Current Population Surveys.

4.1 How do Students Respond to Financial Aid Programs?

Much of the economic literature on the determinants of college attendance focuses on how price affects enrollment. While theory predicts that college demand is negatively related to the cost of education, many studies have tested for the sign and magnitude of the effect of tuition price. Leslie and Brinkman (1989) review studies from the 1970s and 1980s and conclude that a $1,000 (2001 dollars) change in college costs is associated with a four percentage-point difference in college enrollment rates. More recent studies have found similar results. Several exploit state cross-sectional differences to estimate the effect of price. Kane (1995) uses the October Current Population Survey (CPS) to link individual enrollment decisions to the mean tuition costs of a state. He finds that states with higher public tuition levels had lower college entry rates and estimates a price effect similar in magnitude to that found by Leslie and Brinkman. Cameron and Heckman (1999) find a slightly larger effect of six percentage-points using the 1979 National Longitudinal Survey of Youth (NLSY).

College price studies based upon cross-sectional variation in state-level tuition data are primarily identified by fixed differences between states. These estimates could be misleading because it is difficult to distinguish the impact of tuition from any other characteristic of the state that has remained constant over time. Therefore, other work exploits changes in financial aid policy to examine the effect of college costs on enrollment. Dynarski (forthcoming) investigates how the elimination of the Social Security Student Benefit Program in 1982 affected attendance. She finds that the enrollment of the affected group dropped by more than a third with the loss of $1,000 in aid translating into a decreased probability of attending college by 3.6 percentage points. This increase in price was also found to reduce the years of completed schooling by a tenth of a year.

The introduction of the Georgia HTC Scholarship provides further opportunity to exploit a natural experiment. Dynarski (2000) examines the impact of the program on college entry for 18-19 year olds using 1989 to 1997 data from the October CPS. She finds that the HTC program raised college-attendance rates between 7 and 8 percent points. This translates into a three percentage-point impact on college enrollment for every $1,000 (2001 dollars). Cornwell, Mustard, and Sridhar (2001) find slightly smaller estimates of an enrollment effect using institutional data on enrollment. Likewise, Kane (2002) analyzes

the effect of the Cal Grant program and finds large enrollment impacts from eligibility (four to six percentage points). While most studies have focused on recent high school graduates, Seftor and Turner (2002) examine the impact of college costs on nontraditional students with the introduction of the Pell Grant in 1972. They conclude older individuals are more responsive to price after finding elasticities larger than those estimated for younger students (between -0.14 to -0.34).

College prices have also been found to affect choices between institutions. Long (2003) exploits extensive match-specific information between individuals and colleges and approximates the nearly 2,800 alternatives available to potential students. Using the conditional logistic choice model and controls for college expenditures, student body characteristics, and distance, she estimates that an individual is 41 percent less likely to attend a college that costs $1,000 more (2001 dollars), all else equal. For her sample of students from the National Education Longitudinal Study (NELS), this magnitude is enough to move the most preferred college to the fifth position for the average individual. For a simulation that cut the price difference between public and private colleges by half, Long find that up to 29 percent fewer students are predicted to attend public, four-year colleges.

4.2 How might the Tax Credits affect College Enrollment Behavior?

Although the estimates from the literature are helpful in understanding the importance of price in college decisions, none are based on policies similar to the higher education tax credits. The manner of disbursement (through the tax code), the timing of the benefits (up to 15 months later), and the eligibility constraints of the HTC and LLTC make them entirely unique. However, researchers have theorized about their possible effects on postsecondary investments.

The first major issue is whether the tax credits increased college enrollment. College access is of the greatest concern among low-income individuals. In 1997, while 89 percent of high school graduates age 18 to 24 from the top quartile of the income distribution participated in college, only 53 percent from the bottom quartile did so (Mortenson, 1999). However, since the tax credits are nonrefundable and many low-income individuals are not eligible for the credits, many do not expect enrollment to increase for this group (Kane, 1997, 1998 and 1999; Wolanin, 2001). However, the elasticity of college attendance is

likely to be reasonably high for the middle class since they are less likely to be liquidity constrained and have a high overall propensity to attend college. In her analysis of the Georgia HOPE Scholarship, Dynarski (1999) found middle- and upper-income students had the largest enrollment responses. Likewise, if nontraditional students are especially responsive to college costs as found by Seftor and Turner (2002), the tax credits may increase the enrollment of older students.

While commentators do not expect a substantial enrollment response, some suggest that students may be induced to choose more costly colleges. The reason stems from the potential price and income effects created by the tax credits. The HTC and LLTC not only reduce the price of college for recipients, they also alter the marginal cost for students to increase their expenditures. Before the creation of the tax credits, each additional dollar of tuition cost the student an additional dollar (as shown by the diagonal, dashed line). However, with the credits, an additional dollar of expense may not cost the student anything. For example, the marginal cost to a HTC recipient for increases in college tuition is zero for those who pay less than $1,000. To illustrate this point, suppose a school charged $500 in tuition. Its students would be eligible for $500 in HTC aid, and therefore, be able to attend for free. However, the same would be true if the school increased its price to $1,000, and the cost of college net the HTC is zero until $1,000. Another way to state this is that the marginal subsidy for colleges that cost less than or equal to $1,000 is 100 percent. The marginal tuition subsidy for HTC recipients rises to 50 percent for those paying between $1,000 and $2,000. For recipients of the LLTC, the marginal subsidy is 20 percent up to $5,000 meaning the individual is only responsible for 80 cents for each additional dollar charged. Because of these price effects, individuals have clear incentives to attend more expensive schools or spend more on college courses.

Additionally, the tax credits effectively increase an eligible family's college budget. As a result, those eligible for the full HTC are now able to afford $1,500 more in college expenditures while those with the LLTC receive $1,000 more in aid. This is the income effect generated by the tax credits. Depending on the preferences of the individuals, all or only part of this income gain may be spent on a more expensive school. If they are not spent on postsecondary education, the HTC and LLTC could have

a consumption effect. Since the tax credits do not impact the marginal cost of tuition above $5,000 for recipients of the LLTC and $2,000 for recipients of the HTC, they may not lead to sizable increases in college expenditures by families already spending more than $5,000 (Kane, 1998). Finally, the tax credits could prompt individual to substitute for other types of financial aid. For example, since the tax credits do not have to be repaid, they may be preferred over loans.

While the tax credits could encourage enrollment, the delay between the activity and receipt of the aid may reduce the likelihood of any effect. Assuming tuition is paid in January of one year and taxes are filed in April of the following year, it could take up to 15 months to receive a tax credit (Conklin and Finney, 1999). This makes the tax credits a distinctive form of financial aid as most other programs provide support at the time of attendance. Because of this disconnect, it is more likely that the tax credits will be used for expenses other than higher education than other types of aid. Furthermore, credits do not help individuals for whom liquidity is the reason they do not attend college.

4.3 Predictions from the Price Sensitivity Literature

Given the known responses of students to other financial aid policies, one may estimate the possible enrollment effects of the tax credits. Using the 1992-93 NPSAS, Cronin (1997) calculates that the enrollment response by 2002 could be expected to be between 150,000 to 1.4 million additional students with the likely response closer to the low end of the range. However, these calculations are based on the earlier version of the tax credit proposal which included an up to $10,000 tax deduction for older students rather than the LLTC which eventually passed.

To get an approximation of the expected effect of the tax credits on attendance I use estimates found in the literature on the effect of college costs. Assuming the four percentage-point impact per $1,000 in cost, the mean education credit claimed during tax year 2000 ($731) translates to into a 2.9 percentage-point effect. Before the enactment of the policy (fall 1997), 15.4 million students were enrolled in college (Martinez and Day, 1999). This constitutes approximately 36.9 percent of traditionally-aged students (age 18 to 24), 11.8 percent of those age 25 to 29, and 5.7 percent aged 30 to 34. Applying the estimated impact of a $731 credit, an additional 1.1, 0.34, and 0.17 percent of

individuals aged 18 to 24, 25 to 29, and 30 to 35, respectively, should enroll in college. This translates into 101,244 additional students aged 18 to 24, 7,500 aged 25 to 29, and 1,897 aged 30 to 34 for a total of 110,641. Next one must take into account that not everyone is eligible for the aid. Given that approximately two-thirds of individuals are eligible for the credit based on 1997 tax returns, the estimated impact is approximately 74,000 new students age 18 to 34. The policy could have an additional effect on older students by subsidizing occasional courses.

The tax credits could also affect individual choices between colleges. Because of the incentives created by the tax credits, this may especially be true for individuals who would have other attended colleges that cost less than $2,000 (for potential recipients of the HTC) or less than $5,000 (for potential LLTC recipients). For example, a person previously spending $500 might choose to take additional courses or attend a college that charged $1,000. In some instances, the credits reduce the cost gap between competing colleges. For example, before the credits, a $1,000 and $3,000 college cost a difference of $2,000. However, if the person received a HTC, then the difference would only be $1,500 (the new prices would be $0 and $1,500, respectively). This decline in the price gap between colleges is an additional reason some individuals choose institutions that are more expensive than they would otherwise. The College Board (2001b) estimates that 21 percent of full-time undergraduates at four-year colleges paid less than $2,000 in 2000-2001. This translates into approximately 1.6 million students (NCES, 2000). Applying the estimates from Long (2003), the reduction in the price gap between two colleges due to the tax credits could cause up to 29 percent, or 464,000 students, to switch to more expensive schools. The total number is likely to be higher for part-time students since a larger proportion of these students spend less than $2,000.

These rough calculations are based on estimates from traditional financial aid programs. However, there are important distinctions between tax credits and other types of aid that could cause these estimates to not accurately depict the possible impact on the behavior of students. To test for actual enrollment effects, the next section begins to analyze microdata from the period.

4.4 Empirical Strategy

To evaluate the enrollment effects of the HTC and LLTC, I use the 1990 to 2000 October Supplement of the Current Population Survey (CPS). The CPS is a national household survey that gathers school enrollment information each October. Using the information available on family background, I identify the individuals likely to be eligible for a HTC or LLTC and link this to their enrollment decisions. In order to test for a possible effect, I compare how the attendance decisions of those eligible for the credits changed after the policy change. For a control group, I use individuals not eligible for the aid. This Differences-in-Differences analysis technique has been employed to study other financial aid programs, in particular with this data.[34] Using logistic regression models, I estimate the following equation:

$$(1) \qquad Enroll_i = \alpha + \beta_1 \ (Tax\ Credit_i * After_i) + \beta_2\ Tax\ Credit_i + \beta_3\ After_i + \varepsilon$$

where *i* is the i^{th} individual. The parameter β_1 is the reduced-form enrollment effect of the tax credits. It measures whether individuals eligible for the credit acted differently from others after the enactment of the aid policy. The variables "Tax Credit" and "After" are dummy variables equal to one if the person qualifies to take either the HTC or LLTC or if the year is 1998 or after; otherwise the variables are equal to zero. Due to the fact that this paper relies on serially correlated outcomes, the standard errors are adjusted using clustering methods.[35] Because enrollment patterns differ by race, gender, age, and other demographics, these background characteristics are controlled for in the analysis. Additionally, I use state-level information about annual unemployment rates, per capita income, and the percent of the population with a baccalaureate degree to account for differences in economic conditions, levels of wealth, and preferences for education across the country.

Table 10 displays summary statistics for the CPS sample. Means are calculated for traditional-aged (age 18-24) and nontraditional-aged (age 25-40) college students and broken down by eligibility status. The summary statistics highlight how the eligibility criteria favor families with higher income

[34] See Dynarski (2000) and Kane (1995).

levels (but below the eligibility ceiling). Moreover, individuals eligible for the credit are more likely to come from families with married/joint tax return filers.

[TABLE 10 ABOUT HERE]

While the CPS provides a large, annual sample of individuals, there are several important limitations to this dataset. First, information about family income is categorical making it difficult to define the eligibility benchmarks exactly. This grouping also makes it impossible to put family income in constant dollars over time. Second, the income variable is capped at $75,000, which makes defining eligibility for joint returns difficult.[36] For these reasons, some families are incorrectly being counted as eligible for a tax credit when their exact income would disqualify them. This measurement error is likely to attenuate the results. In addition, as shown in Table 10, among the individuals who are enrolled in college, a greater proportion are in four-year colleges (as opposed to two-year colleges) and attend full-time (rather than part-time) than is found in the nation. This suggests that the college-going sample is not nationally representative. More importantly, this may imply that the dataset does not accurately capture all students in the two-year college system and those that attend part-time. As a result, the analysis may not detect changes in enrollment at these types of schools or part-time attendance. Finally, parental income is only available for young adults that appear on their parents' CPS record. This will occur if the individual lives at home or is away at college. Therefore, the probability that a young person will have accurate family income information is a function of their propensity to attend college.

4.5 Analysis of the Enrollment Effects

To discern whether the tax credits had an effect on college enrollment, I test for three possible responses. First, did the likelihood to attend college increase for individuals eligible for a credit? This is a test of the credits' impact on general postsecondary access. Second, did the proportion of college students

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[35] See Bertrand, Duflo, and Mullainathan (2001) for a discussion of how serial correlation affects the standard errors of difference-in-differences estimation.

[36] To account for this, I summed the weekly earnings of everyone in a household. If this amount was greater than $100,000 as an annual income, the household was designated as ineligible. While weekly earnings information was not available for the entire sample, when compared to the categorical family income variable, the amounts were similar for the upper income groups.

who were enrolled at four-year colleges increase? This is a way to examine whether students were induced to spend more on higher education after the creation of the credits. And third, did the percentage of college attendants that were full-time rather than part-time students increase? To measure eligibility, I alternate between three different measures: (i) eligibility for any credit; (ii) the monetary amount of the maximum credit for which a person qualifies; and (iii) the amount of the credit available if the person paid the mean cost of his state's public two-year colleges. The third definition is an approximation of what a marginal student who decides to attend a community college would receive. Since the credits differ in their target groups and generosity, I examine the behavior of several age groups. Younger students (age 18 and 19) are more likely to be affected by the HTC while older students are eligible for the LLTC.

The following analysis reports the results as odds ratios so that values less than one should be interpreted as having a negative relationship with the dependent variable. The coefficient of interest is β_1, which measures whether enrollment behavior changed for the group eligible for the credit after the introduction of the program ($\text{Tax Credit}_i * \text{After}_i$). Several of the models exclude from the sample three states with large financial aid programs that preclude many students from receiving the tax credit (Georgia, Florida, and New Mexico). Each state has a scholarship program that covers full tuition at public colleges within the state for many students. In this circumstance, students would not be eligible to receive any additional aid from the federal government.

Tables 11a, 11b, and 11c display estimates of the tax credit effect on the propensity to enroll in college. For Table 11a, I use whether an individual qualifies for any credit as the measure of eligibility. Overall, I estimate that individuals eligible for the credit are more likely to attend college, but generally, there is no differential increase in enrollment after the introduction of the tax credits. Table 11b investigates if there is any effect on the enrollment decisions of individuals using the maximum monetary amount a student is eligible for based on credit criteria (in thousands of dollars). Similar to above results the estimates are statistically insignificant. The results are the same when defining eligibility using the mean tuition cost of public two-year colleges in the state of residence (Table 11c).

[TABLES 11A, 11B, AND 11C ABOUT HERE]

These results are robust to different definitions of college-going behavior (the inclusion or exclusion of those taking vocational courses; using respondents who answered college-related questions but signified earlier in the survey that they were not in higher education). Furthermore, the results are robust to other specifications. The models were re-estimated limiting the sample to individuals without a college degree, and no enrollment effect was found. Likewise, when the sample is limited to 1995 to 2000 so that estimation is based on three years prior to the policy change and three years after, the results remain statistically insignificant.

[TABLES 12A AND 12B ABOUT HERE]

Rather than affecting access, the tax credits may encourage individuals to buy more education. To test this proposition, Tables 12a and 12b test how the likelihood of attending a four-year institution, conditional on attending any college, is affected by the policy change. If the tax credits encouraged students to attend more expensive colleges, then one would expect for the proportion of students at four-year colleges to increase. However, similar to the above results, none of the estimates are statistically significant.[37] The same is true when testing whether the HTC and LLTC affected whether a person attended college full-time rather than part-time. Although one would expect a positive effect if the credits encouraged individuals to spend more on college, no statistically significant effect is found after the introduction of the credits as shown in Tables 13a and 13b.

[TABLES 13A AND 13B ABOUT HERE]

4.6 Conclusions on the Enrollment Effect

In summary, although the tax credits were promoted as a means to increase college access, this analysis found no enrollment response. During the three years after policy enactment, general enrollment did not appear to increase nor did the proportion of students that attended four-year institutions or were full-time. The lack of finding a substantial response in student enrollment conforms to many of the

forecasts by researchers and critics. The principal benefactors of the tax credits are not likely to be marginal students, and the disconnect between the aid and college attendance is likely to limit the effect of the credits on enrollment. Furthermore, if colleges raised tuition in response to the tax credits (this question is examined in the next section), than this may help to explain why there was little enrollment effect. Finally, with the low take-up rates illustrated in Table 8, not enough families may know about the benefit to have it make a discernable impact on enrollment.

However, the October CPS has several serious limitations for this type of analysis. Due to the categorical definitions of family income, particularly at the higher income levels, it is likely that some students were mislabeled since the data does not allow one to distinguish incomes above $75,000. Moreover, assumptions had to be made about dependent versus independent student status based on age and single versus joint filing status based on family type. For these reasons, eligibility is most certainly measured with error, and some individuals were likely labeled as eligible when in actuality they were not, and vice versa. As a result, the results suffer from attenuation bias. Furthermore, the CPS may not adequately capture college enrollment at two-year colleges or students who attend part-time. Therefore, if the credits had an effect on these groups, it may not be discernable using these data.

Further analysis of these issues using more detailed datasets is necessary to be more confident of the results. Beyond better income information, it would also be useful to have more data on college enrollment behavior. For example, knowing how many credit hours a person completed would help answer questions about the intensity of enrollment. Information on which institution the individual attended and the receipt of other financial aid would help researchers to understand how the tax credits influence college choices and the possible substitution of the credits for other types of aid. A panel dataset would allow one to observe how these factors changed after the introduction of the credits for students already in college. In addition, longitudinal data would allow one to track how students' decisions change after transforming from being eligible for the HTC (the first two years of college) to

[37] Similarly, a multinomial logistic model using three options (not enrolled in college; enrolled in a two-year college; and enrolled in a four-year college) finds no statistically significant change after the introduction of the

instead qualifying for the LLTC. Additional questions exist on a possible consumption effect, but further information on family income and expenditures is necessary for this analysis. It is also worth noting that it may be too soon to witness an enrollment effect. As take up rates for the tax credits increase, more individuals may be influenced by the support in ways discernable by quantitative research.

5. THE IMPACT OF THE TAX CREDITS ON COLLEGE PRICING

While most of the literature on the impact of financial aid policy focuses on the reactions of individuals, researchers have long theorized that the policies may also impact the behavior of postsecondary institutions. Most notably, William Bennett surmised in a 1987 in the *New York Times* that the rise in college tuition prices was due to increases in the availability of government financial aid.[38] With the creation of the higher education tax credits, the Department of Education seemed to be aware of this possibility in the form of reduced institutional aid. In a letter to college presidents, Secretary Richard Riley asked that the tax credits not serve as a "substitute for existing sources of financial assistance" (Riley, 1998).

Researchers have tested the Bennett Hypothesis by examining whether increases in aid translate into increases in tuition prices. McPherson and Schapiro (1991) use annual institutional data to relate changes in the Pell Grant to institutional behavior. They find that increases in government aid are coupled with increases in institutional scholarship spending at private colleges contrary to the predictions of Bennett. In contrast, Li (1999) finds some support for the Bennett Hypothesis using the master files of the Pell Grant Information System to track Pell recipients and the tuition levels of their respective colleges. One possible reason for these conflicting results stems from the difficulty in isolating the effect of government aid on tuition pricing from other factors. It is unclear whether changes in tuition are due to changes in aid or other general trends in higher education. Long (forthcoming) is able to circumvent the issue by examining the effect of the Georgia HOPE Scholarship on in-state institutions. She finds that

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higher education tax credits.

most four-year colleges in Georgia did experience relative increases in net price. While public institutions increased room and board fees, private colleges raised list tuition price and reduced institutional aid. The net effect was to increase costs to students by as much as $0.30 for each dollar of aid. This highlights the importance of the design of a program in ensuring that students, rather than institutions, realize the full benefit and that students who do not receive the aid are not unintentionally negatively affected. This section exploits variation in the incentives created by the introduction of the tax credits to examine their effects on states and institutions.

5.1 How might the Tax Credits Impact Postsecondary Institutions?

Due to the price and income effects created by the tax credits, colleges may have the incentive to increase their prices up to the amount of the aid. The strongest incentives are for colleges that charge tuition below $1,000. As described in the previous section, the marginal cost to a student of a college charging below this amount is zero. For example, if a school charges $500 in tuition, its first- and second-year students would be eligible for $500 in tax credits, and therefore, able to attend for free. However, the same would be true if the school increased its price to $1,000. With the HTC the marginal tuition subsidy is between 50 to 100 percent for institutions charging less than $2,000. It is an additional 20 percent for students past the second year at institutions charging less than $5,000 due to the LLTC.

Another possible institutional reaction to the tax credits could be to re-label room and board charges and other fees as tuition charges because the former do not constitute "qualified" expenses (Kane, 1999). For instance, a college with tuition at $1,000 and room and board charges of $4,000 might be induced to raise the tuition price to $2,000 and lower the room and board charge to $3,000.

Increases in college costs may ultimately stem from action taken by state governments. States are likely to view the increase in federal aid as an opportunity to reduce their support for higher education in the form of appropriations to public colleges thereby increasing tuition prices. The incentives are strongest for states that heavily subsidize public tuition levels to below $2,000. As Kane (1999b)

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[38] From 1975-76 to 1985-86, the mean public four-year tuition increased 55.1 percent in real terms (after accounting for inflation). Private four-year tuition levels increases 37.3 percent. Source: College Board (2001b).

highlights, "To not do so would mean forgoing rather generous new federal subsidies for state taxpayers" (1999, p. 148). While price increases might understandably affect a college's standing relative to competing institutions, state governments are best able to prevent a loss of students. This is because they are able to coordinate the price increases of a large set of colleges. Together with the fact that public colleges are already far less expensive than private schools, individual public colleges face little risk of losing students. However, such price increases may deter students from enrolling in college at all if the tax credits are not perceived by students to offset the additional costs. This is an especially troublesome prospect for students ineligible for the aid due to lack of tax liability.

The incentive to raise tuition prices is also strong for states with large financial aid programs. Since eligibility is based on tuition expenses net grants and scholarships, residents in states with generous programs may not qualify for the full tax credit due to receiving state support. In this case, the eligibility of residents would increase as tuition was increased. State and institutional aid would also be affected if colleges and states perceive the credits as substitutes for other types of aid. This reaction was found when examining the institutional impact of the Georgia HOPE Scholarship on institutional aid awards at private colleges in Georgia (Long, forthcoming).

In fact, many states did react to the introduction of the tax credits by considering ways to capture the federal resources available through the new tax credits. In a report from California's Legislative Analyst's Office, Turnage (1998) notes that the credits "create opportunities to increase the effective federal subsidy of California's higher education programs." He argues that due to California's low-cost community colleges, many other states will have higher per-student subsidies (estimated to be $360 in California while $1,250 in other states). "Due to interactions between the credits and recent state fee reductions, the state is unintentionally sending monies intended for students back to the federal government." Furthermore, by reducing the price differential between the state's community colleges, California State University system, and the University of California system, Turnage suggests that HTC could "unintentionally shift enrollment away from our community colleges to the universities, at potentially great cost to the state and at cross purposes to the state's higher education master plan." For

these reasons, Turnage suggests increasing fees at public colleges in California. He asserts that the tax credits would offset the increase for richer students while financial aid could be given to offset the effect for low-income students. According to his calculations, an increase from $360 to $1,000 at the community colleges would increase funding to these schools by over $100 million annually without impacting the California state budget.

Wolanin (2001) notes other states that responded to the introduction of the tax credits. Budget analysis by the Arkansas legislature recommended that the state reconsider its tuition policies in light of the tax credits. Minnesota, North Carolina, and Washington took similar actions to consider how to devise state financial aid programs while taking into account the HTC support. Another example is New York, which provides need-based aid through its Tuition Assistance Program. Under this program, New York families with a student in a four-year public college would not be eligible for the maximum HTC unless their taxable income is $45,000 or higher. In comparison, most families would be eligible for the full credit if their taxable income is at least $30,000. As a result, the New York State Higher Education Services Corporation recommended studying whether federal funds could be substituted for state funds (New York State, 1998).

If colleges do raise their prices in response to the policy, the tax credit could become in a transfer from the federal government to schools and state governments rather than families. However, some question whether postsecondary institutions would respond to the introduction of the tax credits. Since the strongest incentives to raise tuition prices are for community colleges (i.e. schools with lower tuition levels), and these schools predominantly serve low-income populations not eligible for the tax credit, some suggest that tuition inflation is an unlikely response to the credits (Kane, 1999; Cronin, 1997).

The HTC and LLTC could affect postsecondary institutions in ways other than pricing. The tax credits may give institutions the incentive to find ways to grant half-time degree credit to middle-income taxpayers (Kane, 1999; Cronin, 1997). One possibility is for colleges to create leisure-oriented courses for college credit that would attract taxpayers eligible for the tax credits. For example, colleges could offer $1,000 whale-watching tours with no cost to HTC-eligible students as long as participants receive

half-time credit to a degree (Kane, 1999). This potential abuse mirrors issues raised with the Pell Grant program, however the risk may be greater given the larger number of eligible aid recipients.

Distributing aid through the tax system also creates a number of expensive regulatory requirements for colleges and universities. Higher education institutions must supply the IRS with the names, addresses, and Social Security numbers of all of their students as well as whether the students are enrolled at least half-time, a stipulation of eligibility for the HTC. Additional requirements may be imposed to include information on those who claim a student as a dependent for federal income tax purposes and who may claim HTC (Wolanin, 2001). The National Association of College and University Business Officers estimated that compliance with this full set of requirements would have cost institutions $137 million in 1999 (NACUBO, 1998). Furthermore, the IRS estimates the current reporting burden on institutions to produce needed information is 2.4 million hours (Federal Register, 2000). For tax year 1999, the UC system alone spent nearly $1 million to provide its 371,000 student with the Form 1098, the tuition payment statement necessary to claim a tax credit (Hoblitzell and Smith, 2001). These costs of compliance are an additional reason colleges might increase tuition prices.

5.2 Empirical Strategy

The incentives created by the introduction of the HTC and LLTC are predicted to affect states and colleges in three ways. First, based on the assumption that the intensity of the treatment should affect the magnitude of the response, one would expect to find that colleges with greater numbers of eligible students responded more dramatically to the introduction of the tax credits than colleges with fewer eligible students. Second, although all colleges may have incentives to raise price due to the introduction of the tax credits, colleges with lower tuition rates should experience relatively larger increases in price due to the lower marginal cost to students. Table 14 displays how colleges with different tuition rates are distributed geographically since state support for higher education varies across region. It is important to note that a comparison of public colleges that charged less than $2,000 in 1997 to those that charged more

reflects the differences in the state policies of colleges in the Southeast, Far West, Southwest regions to those in Mideast and Great Lakes regions.[39]

[TABLE 14 ABOUT HERE]

A third prediction is that public colleges in states with substantial aid programs should experience decreases in state support and larger increases in price. Table 15 separates colleges into two groups based on the amount of grant aid awarded by states during the 1997-98 school year. States are considered to have large aid programs if they are in the top eight in terms of total money spent or the amount per student.[40] The states with large aid programs prior to the policy charge were: New York, Illinois, California, Pennsylvania, New Jersey, Ohio, Minnesota, Georgia, Florida, New Mexico, and Vermont. Table 15 also displays how colleges within these states are distributed by tuition level.

[TABLE 15 ABOUT HERE]

To test for these possible effects, I examine how state support for higher education and college tuition levels have evolved over time by noting the policy change between the 1997-98 and 1998-99 school years.[41] I analyze whether the introduction of the HTC and LLTC caused discontinuities among the states and colleges most affected by the policy or with the strongest incentives to alter their behavior. To account for any general trends that have affected all states and universities, colleges in different tuition categories will be used as a control group. The difference between the groups is considered the effect of

[39] The regions are: New England (CT, ME, MA, NH, RI, VT), Mid East (DE, DC, MD, NJ, NY, PA), Great Lakes (IL, IN, MI, OH, WI), Plains (IA, KS, MN, MO, NE, ND, SD), Southeast (AL, AR, FL, GA, KY, LA, MS, NC, SC, TN, VA, WV), Southwest (AZ, NM, OK, TX), Rocky Mountains (CO, ID, MT, UT, WY), Far West (AK, CA, HI, NV, OR, WA).

[40] The benchmark of "top eight" was chosen due to the natural break in the amounts of the next highest states. The next highest state in total amount was North Carolina with $105 million (compared to Florida which was $135 million). The next highest state in per student expenditures was Indiana with $292.50 (compare to $342 for Vermont). Georgia, Florida, and New Mexico are excluded because they each have large aid programs that cover full tuition for a significant proportion of their students. These states, therefore, do not have the incentive to raise tuition prices as they would have to pay for the increase out of their own aid program.

[41] Although the law was passed in 1997, it was not signed until August 1997, a time when tuition rates for the 1997-98 school year were already set. This notion is supported by the timing of state reports in reaction to the credits (e.g. the New York State Higher Education Services Corporation preliminary report is dated March 1998). Furthermore, individuals were only able to claim the credits for higher education expenses incurred after January 1, 1998 for the HOPE and after July 1, 1998 for the LLTC.

the tax credits.[42] Using ordinary least squares estimation, this difference-in-differences calculation can be made:

$$(2) \qquad y_i = \alpha + \delta_1 (\text{After}_i) + \delta_2 (\text{Target Group}_i) + \delta_3 (\text{Target Group}_i * \text{After}_i) + \varepsilon_i$$

where *i* is the i^{th} college, and y is either state support for higher education or list college price. While the first two δs measure general differences in the dependent variable after the policy change and among the target group, the parameter δ_3 is the reduced-form effect of the tax credits – it measures whether colleges with greater incentives to lower state appropriations or raise tuition price acted differently from other schools after the introduction of the aid policy. The variable "Target Group" is a dummy variable equal to one if the college is part of a collection of schools with strong incentives to react to the tax credits. Three groups are examined to match the predictions outlined above: (i) colleges with many credit-eligible students; (ii) low-cost colleges for which tuition increases have a low marginal cost; and (iii) colleges located in states with a large financial aid programs. "After" is a dummy variable equal to one if the year is 1998 or after. Otherwise the dummy variables are equal to zero. Due to the fact that this paper relies on serially correlated outcomes, the standard errors are adjusted using clustering methods.[43] The following results are in logs so that the results may be interpreted as percentages.

While the models test whether colleges with a greater proportion of credit-eligible students experience larger responses, this variable can also be interacted with the other groups of interest. For example, when testing whether lower-cost colleges increased their tuition levels faster than more expensive colleges, it is also relevant to know if lower-cost colleges *with greater numbers* of credit-eligible students reacted more strongly than similarly priced colleges *with fewer potential recipients*. To

[42] In order for the tax credits to be used as an appropriate natural experiment, it must be an exogenous policy. Stated another way, if the tax credits were created in response to the power and preferences of states or postsecondary institutions, the measured responses could reflect some endogenous effect. However, given the reaction of many states and institutions, there is little concern that the reactions of the colleges might be biased in some way.

[43] See Bertrand, Duflo, and Mullainathan (2001) for a discussion of how serial correlation affects the standard errors of difference-in-differences estimation.

test for this possibility, the analysis employs a differences-in-differences-in-differences (DDD) technique to distinguish the reactions of colleges by the intensity of the treatment. The DDD calculation is made:

$$(3) \quad y_i = \alpha + \delta_1 (\text{After}_i) + \delta_2 (\text{Low-Tuition}_i) + \delta_3 (\text{Low-Tuition}_i * \text{After}_i)$$
$$+ \delta_4 (\text{Many Eligible}_i) + \delta_5 (\text{Many Eligible}_i * \text{After}_i) + \delta_6 (\text{Many Eligible}_i * \text{Low-Tuition}_i)$$
$$+ \delta_7 (\text{Low-Tuition}_i * \text{After}_i * \text{Many Eligible}_i) + \varepsilon_i$$

where "Many Eligible" is a dummy variable equal to one if the college has a large proportion of its student body eligible for a tax credit. The parameter δ_7 is the differential effect of the tax credits on low-cost colleges with and without many potential credit recipients.

Since institutions in the different target groups (i.e. ones with large and small proportions of students who are credit-eligible; colleges with high and low tuition levels) are likely to be different in ways that might affect tuition pricing and trends, other control variables are included. First, the market segment of the college and its likely competitors could affect its pricing and expenditures. The most selective colleges offer more institutional financial aid and spend more on instruction than less selective schools, and each group faces different competitive pressures from other institutions. For this reason, the models take into consideration the selectivity level of the college. Second, the preferences, wealth, and economic conditions of a particular state are likely to affect the general offerings and prices of colleges within the state. To account for these factors, the analysis controls for state characteristics such as annual per capita income, the percent of the population with a bachelor's degree in 1999, and the annual unemployment rate. Controls for region are also included. Finally, the amount of state support awarded by the state legislature is highly influential in the pricing decisions of public colleges and universities, particularly in terms of tuition price.[44] Therefore, the models that examine tuition trends also control for the annual amount of state appropriations per student at each school.

[44] The correlation between the mean tuition cost of four-year, public colleges and the mean amount of state appropriations received by such schools was –0.7 from 1977 to 1997 (NCES data). In practice, schools are generally discouraged by legislatures from increasing the tuition above a certain percentage each year. However,

The data for this analysis come from several sources. First, the Integrated Postsecondary Education Data System (IPEDS) provides the necessary institutional detail. This data set documents extensive information on postsecondary institutions within the United States including revenue sources (e.g. state appropriations), list tuition price, and enrollment figures. In order to capture the 1998 inception of the tax credits, I use IPEDS data from the 1993-94 school year to the 1999-2000 school year (the most recent year institutional financial data is available).[45] All figures were inflated to 2000 dollars using the CPI-U. A second source, Barron's *Profiles of American Colleges*, provides selectivity groupings for institutions based on student body grades and test scores as well as admission policies. Data on state characteristics such as the annual unemployment rate, per capita income, and the percent of the population with a bachelor's degree were taken from U.S. Census Bureau and the Bureau of Labor Statistics. Considerable effort was made to have a complete and balanced panel of data. To avoid estimating results driven by yearly fluctuations in composition of the sample rather than a true effect, I imposed a restriction that at least six of the seven possible years of data had to available for each institution.

To measure the proportion of credit-eligible students, I first determined the number of needy, ineligible students using information about the mean Pell Grant at each institution (total Pell Grant awards divided by FTE enrollment). Since Pell Grant awards are partly determined by the cost of school attended, this mean was divided by the list tuition price of the institution, and therefore, the measure should be considered as the percentage of college expenses covered by the mean Pell Grant. Using this measure, colleges with a larger percentage are assumed to have fewer credit-eligible students. Note, however, that a simple comparison of colleges with and without many potential credit beneficiaries is really a comparison of public two-year colleges to four-year institutions due to enrollment patterns by

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substantial increases are allowed when state appropriations are reduced thereby implicitly linking the subsidy and tuition level.

[45] This time span is used for several reasons. First, other D-in-D studies have used similar series of data to study the effects of a financial aid policy. Both Hansen's (1983) and Kane's (1996)'s before and after Pell studies use 3 years of data before the policy change and 4 years after. Furthermore, this time span reflects the American economic

income. Low-income students, who are not eligible for a tax credit, are more likely to attend public, two-year colleges while middle-income students, who are eligible for a credit, often attend public or private four-year schools. Since these types of schools differ in important ways, a comparison of their pricing trends is not truly informative of the institutional effect of the tax credits. To avoid this complication, colleges were defined as having many eligible students if they were in the top half of the distribution (having a lower percentage of college expenses covered by the mean Pell Grant) for their type of school (public, two-year; public, four-year; or private, four-year).

5.3 The Effect on State Support for Higher Education

The introduction of the HTC and LLTC gave states the opportunity to reduce their support for higher education in order to capture some of the rents of the program. While all states had incentives to reduce appropriations because the credits increased student incomes, Table 16a displays results that compare states that had stronger incentives to change their behavior to those with weaker incentives. The coefficients of interest (δ_3) measure the percentage by which each group had either faster or slower relative growth after the tax credits were introduced. All models include controls for year fixed effect, college selectivity, state characteristics, and region.

The first model tests the notion that states had greater incentives to reduce appropriations at colleges with more credit-eligible students. However, the positive coefficient suggests this was not the case at public two-year colleges. In general, colleges with fewer Pell recipients (a proxy for many credit-eligible students) were no more likely to experience reductions in state appropriations and may have experienced increases in state support. However, the colleges with lower tuition prices did experience the larger reductions in state appropriations after 1997 (specification 2). All else equal, public two-year colleges that charged less than $1,000 experienced a 57 percent reduction in state appropriations per student relative to colleges that cost more than $2,000. The decrease was even larger for colleges that charged between $1,000 and $2,000 before the policy change. Among these schools, the reductions were

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expansion of the 1990s and is less likely to be tainted by nationwide business cycles than a longer series of data. Finally, using this time span maximizes the number of institutions that can be used as a constant sample.

largest at colleges with more credit-eligible students conforming to the predictions of theory (specification 3). No similar pattern is found among public four-year colleges; the results are not statistically significant.

[TABLE 16A ABOUT HERE]

Given the geographic distribution of public colleges, these results reflect the actions of colleges in the Southeast and Far West relative to colleges in the Mideast and Great Lakes regions. For this reason, these results may be partly driven by differences *across* regions, and it is therefore necessary to also examine trends *within* regions. Unfortunately, samples size precludes repeating the analysis within most regions except for the Southeast, Southwest, and Far West regions. Each has enough colleges distributed by tuition level, and Table 16b presents the results. Because public two-year and four-year colleges are now being grouped together, the models also include a dummy variable that picks up general differences between the levels of schools. No differences are found between schools with fewer or greater numbers of credit-eligible students. However, in each case, the models suggest that state appropriations did fall substantially at lower-cost colleges with the steepest reductions in the Southwest. Moreover, the reductions were larger for the colleges priced less than $1,000 in comparison to colleges that cost between $1,000 and $2,000 in compliance with the predictions of theory. In summary, it appears that states did in fact lower state appropriations at colleges in which students faced the lowest marginal cost due to pre-policy tuition levels.

[TABLE 16B ABOUT HERE]

Table 17 investigates whether states with large financial aid programs also reduced their support for higher education in response to the introduction of the tax credits. In contrast to the previous results, state appropriations to public two-year colleges in high-aid states increased after 1997 contrary to the incentives created (specification 1). These colleges experienced one and a half times the growth in appropriations than colleges in low-aid states. In fact, two-year, public colleges with more credit-eligible students had larger increases than similar schools with fewer potential recipients (specification 2). This counterintuitive pattern illustrates the wide variance in state policies toward public postsecondary

institutions. While some states seemed to have responded to the tax credits by shifting state appropriations at public two-year colleges in directions that would maximize the ability to capture federal funds, others who already had a proven record of supporting major aid programs for students continued to follow this mission and perhaps even bolstered it in the face of the federal policy. Although the results have the expected negative signs, the models provide no evidence that states altered their state support for public four-year colleges after the introduction of the tax credits.

[TABLE 17 ABOUT HERE]

5.4 The Effect on Colleges Pricing

States were not the only actors to be affected by the new policy. Colleges also had incentives to increase their prices among the beneficiaries of the tax credits. Therefore, Table 18a explores whether public colleges with many credit-eligible students and lower tuition costs increased their list prices faster than other schools after controlling for the aforementioned changes in state appropriations. The first two models suggest that differential trends were not evident among either of these groups. However, colleges that cost between $1,000 and $2,000 and had many credit-eligible students did experience 18 percent faster growth in tuition prices relative to schools with fewer potential recipients or a more expensive price. Dissimilar results are found for public four-year colleges. The less expensive colleges witnessed relative reductions in list price after the introduction of the credits and no difference between schools with fewer or greater numbers of credit-eligible students.[46]

[TABLE 18A ABOUT HERE]

Again, these results may be driven by comparisons of colleges in the Southeast and Far West relative to colleges in the Mideast and Great Lakes regions. Therefore, Table 18b breaks down the analysis within the three largest regions. In the Southeast, while colleges with more potential recipients experienced relative reductions in price, the opposite was true in the Far West. As theory predicts, colleges with many credit-eligible students experienced as 25 percent relative increase in list price in comparison to schools with fewer potential recipients. The results are much clearer among low-cost

colleges. Colleges in the Southeast that cost less than $1,000 prior to the tax credits experienced 32 percent faster growth in cost than colleges priced above $2,000. Likewise, colleges in the $1,000 to $2,000 range increased their prices by 11 percent after 1997. Similar results are found in the Southwest and Far West regions among the less expensive colleges suggesting that the incentives by price level were adequately strong for colleges to react to them.

[TABLE 18B ABOUT HERE]

Table 19 investigates the patterns of colleges in high-aid states. In this case, both public two-year and four-year schools in states with large aid programs raised their tuition prices faster than colleges in other states (by 4.8 and 17.1 percent, respectively). Furthermore, among the public two-year colleges, schools with many credit-eligible students experienced faster tuition growth than others. This provides further evidence that colleges did react to the credits by raising prices at the schools with the greatest incentives. Given the composition of the states in this "high-aid" group, it is possible that the variable is really detecting a differential response to the tax credits in large versus small states. To test this hypothesis, the sample was limited to the top fifteen states in population, and the models were re-estimated. For this analysis the sample size dropped from 1,251 to 709 public colleges. Even with this restriction, the above results remained the same suggesting that they are not due to the relative reactions of larger states.

[TABLE 19 ABOUT HERE]

The pricing trends of private colleges are examined in Table 20. Specification 1 compares colleges with and without many credit-eligible students. Contrary to theory, the schools with the larger treatment experienced a small relative reduction in price. The second two models instead examine patterns by pre-policy tuition level. Unlike among public institutions, there are no colleges that charge less than $2,000. However, the private colleges that charge less than $5,000 have slightly stronger incentives to raise price due to the LLTC (the marginal cost to students with the LLTC is 80 percent). These models suggest that these colleges did not have statistically significant differential pricing trends

[46] Separate analysis was done on room and board trends, but no statistically significant results were found.

even when interacting the variables with the proportion of potential recipients. Further analysis by type of state also does not suggest that colleges reacted to the tax credits. Therefore, any impact on colleges appears to have been concentrated within the public realm. However, because the results are not robust to multiple specifications, the evidence is only suggestive at best.

[TABLE 20 ABOUT HERE]

6. CONCLUSIONS

The 1997 passage of the Hope and Lifetime Learning Tax Credits significantly increased federal support for higher education. According to the Department of Education, the estimated cost of the policy could exceed the amount spent on other major programs like Title I, Head Start, and the School Lunch Program. The introduction of the tax credits also marks a new direction for financial aid as the distinctive features of the HTC and LLTC set them apart from other financial aid programs. First, its eligibility requirements are broadly defined so that up to two-thirds of the population could qualify for a credit based on the income criteria. In addition, the timing of the support in relation to attendance differs greatly from other aid that is awarded at the time when the individual enrolls. As a result, the distribution of the credits, their impact on enrollment, and their influence on the behavior of states and postsecondary institutions are unique compared to other federal initiatives.

What was intended to be a transfer to the middle class has indeed benefited middle-income families. Insufficient tax liability due to low income levels, competing tax credits and deductions, and the interaction with other aid programs prevents many low-income individuals from qualifying for the aid. Conversely, income ceilings prevent high-income families from benefiting. As shown by IRS data on individual tax returns, proportionately more of the tax credits were claimed by returns with an AGI above $30,000. For the 2000 tax year, nearly half of the credits claimed in 2000 were by returns with an AGI between $30,000 and $75,000 although this group makes up only 35 percent of the eligible returns. In a similar manner, although they make up only 13 percent of returns, families with AGIs between $50,000 and $75,000 claimed 22 percent of all education credits during tax year 2000 and realized the largest

credit on average. However, when the amount in credits is compared to federal tax liability, the greatest beneficiaries of the tax credits were those with incomes between $10,000 and $30,000.

Although the maximum HTC and LLTC were $1,500 and $1,000, respectively, for the time period of this analysis, the actual mean benefits were far below these levels. According to IRS data, the average credit was $731 in 2000. Moreover, the substantial number of nontaxable returns, an approximation of the returns with insufficient tax liability to claim a credit, suggests that many families were unable to get the full benefit for which they were eligible.

While tax credits are a new and distinct form of financial aid, the delivery of support through the tax system suffers from some of the same information problems that plague other programs such as the Pell Grants. Usage during the first three years was far below projections. Moreover, among eligible college students according to income level, enrollment behavior, and net tuition expenses, only one-third claimed a credit during the second year of the program. However, participation continues to climb, and if the experience with the EITC is any indication, take up rates could become greater than for other forms of college financial aid.

As with any financial aid program, one would hope that the HTC and LLCT positively affect the enrollment patterns of beneficiaries. First, the credits reduce the overall cost of college. Additionally, they may encourage students to invest in more higher education by altering the marginal cost for students to increase their expenditures. For example, the marginal cost to a HTC recipient who wants to buy $800 of education rather than $500 is zero since the credit would cover the entire expense up to $1,000. However, this study found no evidence that the policy impacted attendance behavior. Using a large sample of individuals from the 1990 to 2000, the analysis did not find increased postsecondary enrollment among credit-eligible students after the introduction of the HTC and LLTC. Additionally, the models tested whether college students increased their investments in higher education by being more likely to choose a four-year rather than two-year institution or attend full-time rather than part-time. Again, there was no discernable effect on the behavior of students affected by the tax credits.

Therefore, although the stated goal of the tax credits was to increase access to higher education, they do not appear to have encouraged additional postsecondary enrollment. It is not surprising that no enrollment effect was found given the design of the program. Foremost, the main beneficiaries of the tax credits are unlikely to be students on the margin of attending college. The low take-up rate of the credits also suggests that not enough families may know about the benefit to have it make a discernable impact on enrollment. Additionally, the disconnect between the timing of the benefit and college enrollment is likely to limit the effect of the credits on college access and choice. Nonetheless, the limitations of the CPS data used in the analysis prompts the need for further research in this area.

On the other hand, states and institutions may have responded to the HTC and LLTC. The analysis suggests that many states reacted by reducing appropriations to public two-year colleges at which students faced a lower marginal cost due to lower tuition levels. These results are robust to analysis within region. Moreover, there is some evidence to support that public two-year colleges responded to incentives created by the tax credits by raising tuition price beyond what can be explained by fluctuations in state support, and the responses were stronger for schools with a greater proportion of credit-eligible students. However, some of the model estimates did not conform to the predictions of theory. Most notably, states with large aid programs (though not the colleges within them) seemed to have continued their efforts to support higher education even after the introduction of HTC and LLTC. Additionally, public four-year colleges often were found not to have the expected differential trends after the policy change or had ones that were in the opposite direction. As with any analysis of this kind, other trends during the late nineties may be driving the results although numerous controls attempt to account for differences in college selectivity, region, and state economic trends.

It is important to note that all colleges had incentives to raise price since the credits increased student incomes. Since these results only highlight the relative differences in trends for low-tuition colleges rather than the price trends of all schools, it is possible that the true effect of the credits on institutions has been much larger. Furthermore, if colleges raised tuition in response to the tax credits, then this may help to explain why little enrollment effect was found. These results document the

importance of considering how a federal program affects the behavior of states and institutions in ways that might undermine the original policy.

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Table 1: Summary of the Federal Tax Credits

	Hope Tax Credit (HTC)	Lifetime Learning Tax Credit (LLTC)
Targeted Group	• Students in their first two years of postsecondary education	• College juniors and seniors • Graduate and professional degree students • Adults upgrading skills or changing careers
Recipient Eligibility	• Available for the first two years of postsecondary education • Must pursue a recognized credential • Must be enrolled at least half time • Must not have a felony drug conviction	• Available for any postsecondary education • Available for an unlimited number of years • Do not need to pursue a recognized credential • Available for one or more courses • Felony drug conviction rule does not apply
Amount	• 100% for the first $1,000 of qualified expenses; 50% on the second $1,000 (Up to $1,500 credit *per eligible student*)	• 20% for the first $5,000 of qualified expenses through 2002 (up to $1,000 credit *per return*) • Starting in 2003 credit covers up to $10,000 of expenses (maximum of $2,000 credit)
Claimant	• Taxpayers may claim a credit for their own tuition expenses or those of their spouse or dependent children	• Maximum credit is determined on a per-taxpayer (family) basis, regardless of the number of post-secondary students in the family
Timeline	• Available for payments made after December 31, 1997 for enrollment after that date	• May claim the credit for amounts paid on or after July 1, 1998 for enrollment beginning on or after July 1, 1998
Expenses Covered	• Tuition and required fees at an educational institution eligible for aid administered by the DOE minus grants, scholarships, and other tax-free educational assistance (including Pell Grants, employer-provided education assistance, and Veteran's educational assistance) • Note: The expenses covered do not include the cost of insurance, medical expenses (including student health fees, room and board, transportation, or living expenses)	
Income Eligibility	• Phased out for joint filers with $80,000 to $100,000 of modified AGI ($40,000 to $50,000 for single filers) • Married couples must file a joint return to claim a benefit • Phased out for single filers with $40,000 to $50,000 modified AGI • Individuals must modify their AGI to include income earned abroad	
Other Details	• Families are able to claim the Lifetime Learning tax credit for some members and Hope credit for others in the same year. However, the same student cannot take both credits.	

Notes: Summarized from Internal Revenue Service (1998c) *Tax Benefits for Higher Education*.

Table 2: Percent Eligible for the Higher Education Tax Credits

	All Students (Full-time and Part-time)			Full-time Students
	Hope	Lifetime Learning	Either Tax Credit	Either Tax Credit
Student Level				
Undergraduate	22.33	20.80	43.13	55.94
Master's	---	53.33	53.33	57.27
Doctoral	--	52.82	52.82	50.83
Professional	--	42.73	42.73	42.91
Other Graduate Degree	--	45.68	45.68	62.09
College Type				
Public Two-year	24.45	10.62	35.06	52.98
Private Two-year	35.61	7.68	43.28	55.97
Public Four-year	14.58	34.96	49.54	54.42
Private Four-year	15.05	37.80	52.85	58.18
Proprietary (for-profit)	32.81	21.01	53.83	70.92
Less than Two-year	21.15	12.25	33.40	56.96

Notes: Calculations by author using the 1999-2000 National Postsecondary Student Aid Survey. Assumes that the 1999-2000 school year is representative of a tax year (January - December). Eligibility is based on income, year in school, intensity, and having net tuition expenses greater than zero (tuition minus all grants). To make nationally representative, weights supplied by the survey were use.

Table 3a: Higher Education Tax Credits, 2000

	All Returns	Size of Adjusted Gross Income					
		Below $10,000	$10,000 to $19,999	$20,000 to $29,999	$30,000 to $49,999	$50,000 to $74,999	$75,000 to $99,999
Number of returns	130,122,204	25,947,174	23,678,120	18,533,555	23,878,431	17,263,552	8,547,241
Higher Education Tax Credits							
Number of Credits	6,698,163	258,220	1,110,604	1,054,598	1,736,226	1,472,598	1,062,644
Amount of Credits (000s)	$4,896,215	59,744	689,679	772,886	1,300,231	1,328,260	718,376
% of Group that Claimed a Credit	5.15	1.00	4.69	5.69	7.27	8.53	12.43
Higher Education Tax Credits Beneficiaries							
Mean Education Credit	$731	231	621	733	749	902	676
% of Education Credits Claimed	---	3.86	16.58	15.74	25.92	21.99	15.86
Share of Benefits compared to Share of Costs							
Share of Credits (#) ÷ Share of Returns (#)	---	0.18	0.83	1.00	1.28	1.50	2.19
Share of Credits ($) ÷ Share of Returns ($)	---	3.42	3.41	1.72	1.06	0.67	0.57

Source: Internal Revenue Service, Information Services, Martinsburg Computing Center, Master File Service Support Branch. Figures represent all returns filed and processed through the Individual Master File (IMF) system during 2000.

Table 3b: Higher Education Tax Credits, 1999

	All Returns	Size of Adjusted Gross Income					
		Below $10,000	$10,000 to $19,999	$20,000 to $29,999	$30,000 to $49,999	$50,000 to $74,999	$75,000 to $99,999
Number of returns	127,667,890	26,559,779	24,104,823	18,392,185	23,356,750	16,585,331	7,840,255
Higher Education Tax Credits							
Number of Credits	6,293,257	256,435	1,012,410	942,949	1,613,629	1,461,293	1,003,858
Amount of Credits (000s)	$4,582,262	57,539	602,818	658,305	1,200,017	1,355,245	705,623
% of Group that Claimed a Credit	4.93	0.97	4.20	5.13	6.91	8.81	12.80
Higher Education Tax Credits Beneficiaries							
Mean Education Credit	$728	224	595	698	744	927	703
% of Education Credits Claimed	---	4.08	16.09	14.99	25.65	23.23	15.96

Source: Internal Revenue Service, Information Services, Martinsburg Computing Center, Master File Service Support Branch.

Table 3c: Higher Education Tax Credits, 1998

	All Returns	Size of Adjusted Gross Income					
		Below $10,000	$10,000 to $19,999	$20,000 to $29,999	$30,000 to $49,999	$50,000 to $74,999	$75,000 to $99,999
Number of returns	124,770,662	26,289,293	24,625,806	18,292,760	23,108,693	15,886,502	7,221,303
Higher Education Tax Credits							
Number of Credits	4,652,596	185,999	675,633	647,673	1,203,273	1,186,887	753,125
Amount of Credits (000s)	$3,376,647	40,045	411,495	430,119	843,528	1,092,185	559,273
% of Group that Claimed a Credit	3.73%	0.71	2.74	3.54	5.21	7.47	10.43
Higher Education Tax Credits Beneficiaries							
Mean Education Credit	$726	215	609	664	701	920	743
% of Education Credits Claimed	---	4.00	14.52	13.92	25.86	25.51	16.19

Source: Internal Revenue Service, Information Services, Martinsburg Computing Center, Master File Service Support Branch.

Table 4: Total Tax Liability Relative to Total Higher Education Tax Credits by Income Group, 2000 (amounts in thousands)

	All Returns	Size of Adjusted Gross Income					
		Below $10,000	$10,000 to $19,999	$20,000 to $29,999	$30,000 to $49,999	$50,000 to $74,999	$75,000 to $99,999
Total Taxable Income	$4,510,367,610	15,797,752	114,306,435	238,991,172	593,307,519	734,353,450	535,083,911
Total Federal Tax Liability	$1,019,928,541	4,236,231	18,264,729	34,275,965	91,388,580	123,438,299	103,771,900
Total Education Tax Credits	$4,896,215	59,744	689,679	772,886	1,300,231	1,328,260	718,376
% of Liability Covered by Credits	0.5%	1.4	3.8	2.3	1.4	1.1	0.7

Source: Internal Revenue Service. Figures represent all returns filed and processed through 2000. Total Taxable Income is income minus deductions.

Table 5: Tax Liability Relative to Higher Education Tax Credits calculated at the Means of Each Income Group, 2000

	All Returns	Size of Adjusted Gross Income					
		Below $10,000	$10,000 to $19,999	$20,000 to $29,999	$30,000 to $49,999	$50,000 to $74,999	$75,000 to $99,999
Mean Taxable Income	$42,719	1,846	6,113	13,243	25,014	42,629	62,680
Mean Federal Tax Liability	$9,724	401	1,056	2,031	3,913	7,176	12,154
Total Education Tax Credits	$731	231	621	733	749	902	676
Percent of Federal Liability Covered by Education Credits	7.5%	57.7	58.8	36.1	19.1	12.6	5.6
Lifetime Federal Tax Liability (multiply liability by 33)	$320,892	$13,233	$34,848	$67,023	$129,129	$236,808	$401,082
Lifetime Education Credits Taken (multiply mean credit by 8)	$5,848	$1,848	$4,968	$5,864	$5,992	$7,216	$5,408
Percent of Lifetime Liability Covered by Lifetime Credits	1.8%	14.0	14.3	8.78	4.6	3.1	1.4

Source: Internal Revenue Service. Figures represent all returns filed and processed through 2000. Total Taxable Income is income minus deductions. To determine the lifetime credits taken, the mean amount is multiplied by eight assuming a family with two children who each attend college for four years. To determine the lifetime tax liability, the amount is multiplied by 33 as suggested by Murphy and Welch (1990) in their examination of earnings profiles.

Table 6: Tax Credit Beneficiaries by State, 2000

	Higher Education Tax Credit Beneficiaries, 2000				Expected Number of Beneficiaries (Government Projection)	Actual ÷ Expected Number of Credits
	Number of Returns	Total Credits (000s dollars)	Mean Credit per Return	Percent of Returns		
State Mean (standard dev.)	130,771 (147,077)	95,243 (104,425)	725 (85)	5.24 (1.00)	256,843 (326,552)	---
State Median	80,855	57,854	718	5.29	165,000	---
Alabama	88,196	64,806	735	4.63	197,000	44.77
Alaska	18,884	12,300	651	5.74	36,000	52.46
Arizona	117,874	71,328	605	5.48	307,000	38.40
Arkansas	47,480	30,473	642	4.25	91,000	52.18
California	824,789	502,925	610	5.55	2,073,000	39.79
Colorado	122,060	80,653	661	5.82	238,000	51.29
Connecticut	78,960	63,572	805	4.72	126,000	62.67
District of Columbia	14,813	12,579	849	5.30	68,000	21.78
Delaware	18,110	13,780	761	4.79	32,000	56.59
Florida	322,736	223,863	694	4.30	667,000	48.39
Georgia	141,427	101,535	718	3.89	284,000	49.80
Hawaii	34,234	24,680	721	5.98	58,000	59.02
Idaho	31,905	21,594	677	5.70	51,000	62.56
Illinois	319,085	247,883	777	5.51	659,000	48.42
Indiana	130,909	103,779	793	4.61	260,000	50.35
Iowa	93,110	70,529	757	6.89	150,000	62.07
Kansas	77,440	46,874	605	6.33	177,000	43.75
Kentucky	77,188	54,628	708	4.42	128,000	60.30
Louisiana	80,855	57,854	716	4.31	153,000	52.85
Maine	28,401	25,193	887	4.69	47,000	60.43
Maryland	144,925	113,372	782	5.65	272,000	53.28
Massachusetts	165,460	132,623	802	5.32	359,000	46.09
Michigan	244,532	182,154	745	5.29	503,000	48.61
Minnesota	151,921	118,549	780	6.37	257,000	59.11
Mississippi	41,742	28,763	689	3.56	100,000	41.74
Missouri	136,227	91,796	674	5.31	276,000	49.36
Montana	23,645	17,410	736	5.57	35,000	67.56
Nebraska	55,529	36,446	656	6.86	122,000	45.52
Nevada	43,342	25,714	593	4.54	78,000	55.57
New Hampshire	34,009	28,410	835	5.41	52,000	65.40
New Jersey	221,033	193,465	875	5.43	266,000	83.10
New Mexico	32,541	17,973	552	4.47	97,000	33.55
New York	498,887	424,878	852	5.82	757,000	65.90
North Carolina	174,416	109,906	630	4.80	351,000	49.69
North Dakota	22,405	16,294	727	7.40	30,000	74.68

Table continues on the next page.

Table 6: Tax Credit Beneficiaries by State, 2000 – *continued*

	Higher Education Tax Credit Beneficiaries, 2000				Expected Number of Beneficiaries (Government Projection)	Actual ÷ Expected Number of Credits
	Number of Returns	Total Credits (000s dollars)	Mean Credit per Return	Percent of Returns		
Ohio	256,297	210,750	822	4.60	478,000	53.62
Oklahoma	73,057	44,005	602	4.99	165,000	44.28
Oregon	83,056	53,874	649	5.32	183,000	45.39
Pennsylvania	292,685	263,167	899	5.04	472,000	62.01
Rhode Island	28,549	21,382	749	5.77	65,000	43.92
South Carolina	77,692	54,186	697	4.31	152,000	51.11
South Dakota	24,884	20,148	810	7.01	34,000	73.19
Tennessee	112,161	81,360	725	4.37	211,000	53.16
Texas	444,974	309,031	694	4.92	893,000	49.83
Utah	75,800	53,309	703	8.05	118,000	64.24
Vermont	14,168	12,625	891	4.73	35,000	40.48
Virginia	171,398	115,641	675	5.13	325,000	52.74
Washington	144,792	100,558	694	5.22	243,000	59.59
West Virginia	33,311	23,992	720	4.44	71,000	46.92
Wisconsin	164,466	116,656	709	6.33	265,000	62.06
Wyoming	12,951	8,133	628	5.51	32,000	40.47

Source of Beneficiaries data: IRS, Information Services, Martinsburg Computing Center, Master File Service Support Branch. Source of Projections data: Education Department estimates based on State-level enrollment, Pell Grant recipient data, and the President's fiscal year 2000 budget policy. Notes: Classification by state is usually based on the taxpayer's home address. However, some taxpayers may have used the address of a tax lawyer or accountant or the address of a place of business.

Table 7: Percent of Parents who have heard of the Tax Credits, 1999

	Either Tax Credit	Hope Tax Credit	Lifetime Learning Tax Credit	Number of Observations
Mean	33.3	21.5	18.7	8,552
Race				
White	32.8	22.5	21.4	5,355
Black	28.3	22.9	12.9	1,326
Hispanic	22.5	16.2	13.7	1,392
All other races	30.9	23.2	17.8	479
Household Income				
$10,000 or less	19.3	14.6	10.4	540
$10,001-$20,000	22.7	17.2	11.3	851
$20,001-$30,000	24.6	18.5	12.2	1,202
$30,001-$40,000	27.9	20.5	14.9	1,253
$40,001-$50,000	29.0	20.6	18.5	1,023
$50,001-$75,000	33.2	23.1	21.6	1,704
More than $75,000	39.9	26.9	27.9	1,979
Parent's Education				
Less than High School	20.8	15.6	11.1	665
High School Degree	22.7	17.5	10.7	2,105
Vocational or Some College	30.0	20.9	17.0	2,657
College Degree	37.4	26.1	25.0	1,465
Graduate Degree	38.6	26.0	28.8	1,660
Child's Level of Schooling				
Elementary School	25.4	18.3	14.8	818
Middle School	28.7	19.0	17.0	2,639
High School	32.2	23.6	20.2	4,055
Combined School	31.3	22.7	20.2	922

Source: National Household Education Survey, Parent Interview, 1999.

Table 8: Percentage that Claimed a Higher Education Tax Credit

	All Students	Dependent (Traditional) Undergraduates	Independent (Nontraditional) Undergrads	Graduate and Professional Students
Definition #1: Eligible by Income and Attendance (14,930 observations)				
Whole Sample	27.27	19.63	31.79	34.83
Male Students	25.66	17.73	31.40	32.68
Female Students	28.35	20.97	32.00	36.49
White Students	28.86	21.05	34.43	35.71
Black Students	21.00	12.86	23.66	30.30
Hispanic Students	21.97	15.24	25.26	32.39
Asian Students	23.51	15.61	29.82	30.36
Not born in the U.S.	23.58	17.05	24.21	28.43
Parents - HS Degree	27.01	18.63	31.68	32.16
Parents - Some College	27.94	21.58	32.41	38.71
Parents - College Degree	27.23	18.92	33.96	35.35
Fulltime Students	26.22	19.50	33.38	37.36
Parttime Students	31.08	20.56	30.63	36.64
Public Two-year	20.83	15.68	25.12	---
Public Four-year	28.51	20.63	34.12	35.69
Private Four-year	28.87	20.10	36.79	34.09
Proprietary College	23.82	18.99	25.41	26.83
Definition #2:Eligible by Income, Attendance, and Positive Net Tuition (11,742 observations)				
Whole Sample	29.43	21.08	34.47	37.90
Male Students	27.67	19.04	33.21	36.66
Female Students	30.63	22.54	35.23	38.81
White Students	30.73	22.18	36.77	39.01
Black Students	23.81	14.29	27.12	32.21
Hispanic Students	24.98	18.35	28.49	32.99
Asian Students	25.77	16.67	31.00	34.31
Not born in the U.S.	25.36	17.93	24.91	31.43
Parents - HS Degree	29.52	20.98	34.25	34.64
Parents - Some College	30.43	23.53	34.84	43.59
Parents - College Degree	28.95	19.46	36.37	38.96
Fulltime Students	28.48	20.95	36.68	41.87
Parttime Students	32.71	21.78	32.36	38.47
Public Two-year	23.19	17.57	28.52	---
Public Four-year	30.91	22.46	37.16	38.44
Private Four-year	30.76	20.82	38.85	37.75
Proprietary College	24.56	18.97	26.39	29.00

Source: 1999-2000 National Postsecondary Student Aid Survey, CATI respondents. Sample limited to students who are eligible for a tax credit based on 1999 family income and attendance. Due to incomplete information on net tuition expenses for the 1999 tax year, the proportions were calculated with and without the restriction of positive net tuition for the 1999-2000 school year.

Table 9: Likelihood Eligible Students Claimed a Credit (Logistic Regression Models)
Dependent Variable: Claimed a Tax Credit in 1999 (odds ratios reported)

	Eligible by Income & Attendance			*Eligible by Income, Attendance, & Net Tuition*		
	Dependent Undergrads	Independent Undergrads	Graduate Students	Dependent Undergrads	Independent Undergrads	Graduate Students
	(1)	(2)	(3)	(4)	(5)	(6)
Demographics						
Female	1.2848** (3.80)	1.1081 (1.51)	1.2899** (3.63)	1.2940** (3.61)	1.1733** (2.12)	1.1971** (2.32)
Black	.6347** (3.34)	.7019** (3.39)	.8036* (1.72)	.6400** (2.79)	.7628** (2.29)	.7715* (1.87)
Hispanic	.7048** (2.72)	.6698** (3.21)	.8615 (1.00)	.8274 (1.32)	.7168** (2.38)	.7586* (1.67)
Asian	.6654* (1.88)	.9986 (0.01)	.7480 (1.45)	.6688* (1.66)	1.0575 (0.21)	.7663 (1.23)
Immigrant	1.0069 (0.04)	.7142** (2.08)	.7319** (2.06)	.9873 (0.06)	.6450** (2.51)	.7682 (1.59)
Age	1.1808** (5.57)	.9928** (1.81)	.9846** (3.68)	1.1674** (4.80)	.9910** (2.04)	.9844** (3.45)
Family Characteristics						
Parents Married	1.2847** (2.94)	---	---	1.213** (2.04)	---	---
Parents: HS or below	Baseline	---	---	Baseline	---	---
Parents: some college education	1.2092** (2.17)	---	---	1.1652 (1.62)	---	---
Parents: college degree	.9793 (0.25)	---	---	.8975 (1.21)	---	---
Student Married	---	1.2914** (3.62)	1.2513** (2.85)	---	1.3709** (4.01)	1.1477 (1.60)
EFC (000s)	1.0014 (0.26)	.9988 (0.28)	.9832** (4.61)	.9963 (0.65)	.9938 (1.35)	.9859** (3.61)
College Attendance Characteristics						
Freshman or Sophomore	.9605 (0.41)	.6585** (4.35)	---	.9001 (0.99)	.6566** (3.96)	---
Parttime	1.0360 (0.26)	.9751 (0.33)	1.1227 (1.26)	.9593 (0.29)	.8742 (1.60)	.9809 (0.19)
Less than Parttime	1.5889 (1.43)	.6328** (3.42)	.8037** (2.31)	1.4891 (1.17)	.6153** (3.31)	.7011** (3.39)
Net Tuition (000s)	1.0070 (0.83)	1.0611** (4.57)	1.0371** (4.90)	.9928 (0.76)	1.0227 (1.56)	1.0075 (0.88)
Observations	6,362	4,558	4,010	5,048	3,524	3,170
R-squared	.0235	.0343	.0310	.0218	.0335	.0256

Source: 1999-2000 National Postsecondary Student Aid Survey, CATI respondents. Sample limited to students who are eligible for a tax credit based on 1999 family income and attendance pattern. Due to incomplete information on expenses for the 1999 tax year, the proportions were calculated with and without the restriction of positive net tuition. Each regression also includes controls for the type of college attended and academic program for graduate students (Master's, Doctoral, Professional, or other graduate program).

Table 10: Summary Statistics of the 1990-2000 October Current Population Survey

	Age 18-24 (Traditional College Age)		Age 25-40	
	Not Eligible for Any Credit	Eligible for a HE Tax Credit	Not Eligible for Any Credit	Eligible for a HE Tax Credit
Percentage	41.9	58.1	24.9	75.1
Demographic Characteristics				
Age	21.2 (1.8)	21.1 (2.0)	32.0 (4.6)	33.1 (4.5)
Female	53.8	51.2	53.1	51.9
Black	15.0	7.8	17.2	7.3
Asian	4.4	4.4	4.0	3.8
Hispanic	6.6	4.3	5.6	3.8
Married	18.9	17.1	31.6	75.2
Educational Attainment				
High School Degree	46.7	35.9	48.9	35.1
Some College	42.6	51.1	29.3	31.7
Bachelor's Degree	9.3	11.7	14.8	23.5
Graduate Degree	1.1	1.2	6.7	9.6
College Attendance Behavior				
Enrolled in College	35.7	46.3	9.5	6.7
Four-year College	73.9 [14,720]	75.5 [26,453]	70.0 [7,048]	70.4 [15,044]
Full-time	83.7 [14,720]	85.1 [26,453]	60.0 [7,048]	33.2 [15,044]
Income and Labor Market Status				
Family Income (categorical)	4.52 (3.37)	10.53 (2.36)	5.26 (4.04)	10.20 (2.39)
Joint Return (for parents if a dependent)	30.8	79.5	32.1	80.7
Single Return	69.2	20.5	67.9	19.3
Employed	66.8	69.4	73.1	85.4
Unemployed	7.9	4.8	6.6	2.1
Out of Labor Force	24.2	25.1	19.7	11.3
Potential Education Tax Credit Benefit				
Maximum HE Credit	0	914 (333)	0	851 (229)
Credit at a State Public Two-year	0	796 (333)	0	781 (273)
Observations	41,220	57,074	73,952	222,889

Source: October CPS data 1990-2000. Standard deviations are reported in parentheses. If the full sample was not used in calculating a mean, the number of observations is noted in bracket. The percentages of the sample that are attending four-year colleges or are full-time were calculated conditional on enrollment in college.

Table 11a: The Likelihood of Attending Any College (odds ratios reported)
Variable of Interest: Eligible for Any Higher Education Credit

	Age of Traditional College Students		Traditional College Students (excluding full-tuition programs)		Nontraditional Students	All Ages
	Age 18-19	Age 18-24	Age 18-19 (No GA,FL,NM)	Age 18-24 (No GA,FL,NM)	Age 25-40	Age 18 – 40
	(1)	(2)	(3)	(4)	(5)	(6)
After	0.6889**	0.8720**	0.6601**	0.8748**	0.9535	0.9534
	(4.00)	(2.85)	(4.29)	(2.63)	(0.99)	(1.50)
Eligible for Any Credit?	1.1414**	1.1885**	1.1342*	1.1856**	0.9677	1.0778**
	(2.14)	(5.07)	(1.93)	(4.70)	(0.96)	(2.91)
After * Any Credit	0.9392	0.9342	1.0051	0.9390	1.0077	0.9825
	(0.63)	(1.38)	(0.05)	(1.19)	(0.21)	(0.56)
Observations	24,291	98,294	22,781	91,811	296,841	395,135
R-squared	0.35	0.34	0.35	0.34	0.12	0.32

** Statistically Significant at 5% level * Statistically Significant at 10% level
Source: October CPS data 1990-2000. Robust z statistics are reported in parentheses. Each model contains year fixed effects and controls for gender, race (dummy variables for black, Asian, and Hispanic), age, marital status, level of education, a dummy variable for being employed, family income (categorical), and the annual unemployment rate, per capita income, and percentage with a baccalaureate degree of the individual's state.

Table 11b: The Likelihood of Attending Any College (odds ratios reported)
Variable of Interest: Monetary amount of the Maximum Credit Eligible (thousands)

	Age of Traditional College Students		Traditional College Students (excluding full-tuition programs)		Nontraditional Students	All Ages
	Age 18-19	Age 18-24	Age 18-19 (No GA,FL,NM)	Age 18-24 (No GA,FL,NM)	Age 25-40	Age 18 – 40
	(1)	(2)	(3)	(4)	(5)	(6)
After	0.6974**	0.8468**	0.6749**	0.8494**	0.9456	0.9467*
	(4.39)	(3.58)	(4.58)	(3.34)	(1.21)	(1.80)
Maximum Credit	0.9846	1.1919**	0.9764	1.1871**	1.0049	1.2633**
	(0.36)	(5.74)	(0.53)	(5.29)	(0.14)	(10.20)
After * Max Credit	0.9421	0.9811	0.9844	0.9873	1.0170	0.9862
	(0.88)	(0.39)	(0.23)	(0.24)	(0.40)	(0.40)
Observations	24,291	98,294	22,781	91,811	296,841	395,135
R-squared	0.35	0.34	0.35	0.34	0.12	0.32

** Statistically Significant at 5% level * Statistically Significant at 10% level
Source: October CPS data 1990-2000. Robust z statistics are reported in parentheses. Each model contains year fixed effects and controls for gender, race (dummy variables for black, Asian, and Hispanic), age, marital status, level of education, a dummy variable for being employed, family income (categorical), and the annual unemployment rate, per capita income, and percentage with a baccalaureate degree of the individual's state.

Table 11c: The Likelihood of Attending Any College (odds ratios reported)
Variable of Interest: Credit if charged the State Mean Public Two-year Tuition (thousands)

	Age of Traditional College Students		Traditional College Students (excluding full-tuition programs)		Nontraditional Students	All Ages
	Age 18-19	Age 18-24	Age 18-19 (No GA,FL,NM)	Age 18-24 (No GA,FL,NM)	Age 25-40	Age 18 – 40
	(1)	(2)	(3)	(4)	(5)	(6)
After	0.6800**	0.8539**	0.6626**	0.8580**	0.9604	0.9628
	(4.92)	(3.25)	(5.02)	(3.02)	(0.88)	(1.20)
Max Credit @ Public 2-year	0.9977	1.1366**	0.9902	1.1302**	0.9935	1.1736**
	(0.04)	(3.87)	(0.18)	(3.52)	(0.20)	(7.28)
After * Max 2-year Credit	0.9651	0.9690	1.0093	0.9728	0.9895	0.9630
	(0.42)	(0.53)	(0.11)	(0.44)	(0.23)	(0.94)
Observations	24,291	98,294	22,781	91,811	296,841	395,135
R-squared	0.35	0.34	0.35	0.34	0.12	0.32

** Statistically Significant at 5% level * Statistically Significant at 10% level

Source: October CPS data 1990-2000. Robust z statistics are reported in parentheses. Each model contains year fixed effects and controls for gender, race (dummy variables for black, Asian, and Hispanic), age, marital status, level of education, a dummy variable for being employed, family income (categorical), and the annual unemployment rate, per capita income, and percentage with a baccalaureate degree of the individual's state.

Table 12a: The Likelihood of Attending a Four-year College conditional on Enrollment (odds ratios)
Variable of Interest: Eligible for Any Credit

	Age of Traditional College Students		Traditional College Students (excluding full-tuition programs)		Nontraditional Students	All Ages
	Age 18-19	Age 18-24	Age 18-19 (No GA,FL,NM)	Age 18-24 (No GA,FL,NM)	Age 25-40	Age 18 – 40
	(1)	(2)	(3)	(4)	(5)	(6)
After	0.9691	0.7969**	0.9454	0.7977**	0.8588	0.8181**
	(0.24)	(2.91)	(0.41)	(2.86)	(1.47)	(2.94)
Eligible for Any Credit?	0.7314**	0.8295**	0.7549**	0.8447**	0.8457**	0.8435**
	(5.16)	(4.48)	(4.60)	(4.07)	(3.46)	(4.85)
After * Any Credit	0.8929	0.9251	0.9444	0.9155	1.0078	0.9462
	(1.00)	(1.18)	(0.51)	(1.33)	(0.09)	(0.99)
Observations	15,016	41,173	14,150	38,665	22,092	63,265
R-squared	0.06	0.08	0.06	0.08	0.16	0.10

** Statistically Significant at 5% level * Statistically Significant at 10% level
Source: October CPS data 1990-2000. Robust z statistics are reported in parentheses. Each model contains year fixed effects and controls for gender, race (dummy variables for black, Asian, and Hispanic), age, marital status, level of education, a dummy variable for being employed, family income (categorical), and the annual unemployment rate, per capita income, and percentage with a baccalaureate degree of the individual's state.

Table 12b: The Likelihood of Attending a Four-year College conditional on Enrollment (odds ratios)
Variable of Interest: Monetary amount of the Maximum Credit Eligible (thousands)

	Age of Traditional College Students		Traditional College Students (excluding full-tuition programs)		Nontraditional Students	All Ages
	Age 18-19	Age 18-24	Age 18-19 (No GA,FL,NM)	Age 18-24 (No GA,FL,NM)	Age 25-40	Age 18 – 40
	(1)	(2)	(3)	(4)	(5)	(6)
After	0.9005	0.7728**	0.8806	0.7656**	0.8597	0.8065**
	(0.86)	(3.48)	(0.97)	(3.46)	(1.45)	(3.24)
Maximum Credit	0.7530**	0.7583**	0.7606**	0.7661**	0.8424**	0.7535**
	(6.51)	(7.90)	(5.84)	(7.12)	(3.97)	(9.83)
After * Max Credit	0.9885	0.9677	1.0384	0.9727	0.9966	0.9649
	(0.14)	(0.57)	(0.50)	(0.46)	(0.04)	(0.67)
Observations	15,016	41,173	14,150	38,665	22,092	63,265
R-squared	0.06	0.08	0.06	0.08	0.16	0.10

** Statistically Significant at 5% level * Statistically Significant at 10% level
Source: October CPS data 1990-2000. Robust z statistics are reported in parentheses. Each model contains year fixed effects and controls for gender, race (dummy variables for black, Asian, and Hispanic), age, marital status, level of education, a dummy variable for being employed, family income (categorical), and the annual unemployment rate, per capita income, and percentage with a baccalaureate degree of the individual's state.

Table 13a: The Likelihood of Attending Full-time conditional on Enrollment (odds ratios reported)
Variable of Interest: Eligible for Any Credit

	Age of Traditional College Students		Traditional College Students (excluding full-tuition programs)	
	Age 18-19	Age 18-24	Age 18-19 (No GA,FL,NM)	Age 18-24 (No GA,FL,NM)
	(1)	(2)	(3)	(4)
After	1.1694	0.9345	1.1435	0.9061
	(1.01)	(0.95)	(0.81)	(1.35)
Eligible for Any Credit?	1.0219	0.9635	1.0395	0.9643
	(0.19)	(0.63)	(0.31)	(0.58)
After * Any Credit	0.8954	0.9908	0.9148	0.9989
	(0.83)	(0.12)	(0.63)	(0.01)
Observations	15,016	41,173	14,150	38,665
R-squared	0.10	0.15	0.10	0.15

** Statistically Significant at 5% level * Statistically Significant at 10% level
Source: October CPS data 1990-2000. Robust z statistics are reported in parentheses. Each model contains year fixed effects and controls for gender, race (dummy variables for black, Asian, and Hispanic), age, marital status, level of education, a dummy variable for being employed, family income (categorical), and the annual unemployment rate, per capita income, and percentage with a baccalaureate degree of the individual's state.

Table 13b: The Likelihood of Attending Full-time conditional on Enrollment (odds ratios reported)
Variable of Interest: Monetary amount of the Maximum Credit Eligible (thousands)

	Age of Traditional College Students		Traditional College Students (excluding full-tuition programs)	
	Age 18-19	Age 18-24	Age 18-19 (No GA,FL,NM)	Age 18-24 (No GA,FL,NM)
	(1)	(2)	(3)	(4)
After	1.0440	0.9320	1.0310	0.9032
	(0.30)	(1.07)	(0.19)	(1.52)
Maximum Credit	0.8970	0.9215*	0.9084	0.9254*
	(1.50)	(1.88)	(1.23)	(1.67)
After * Max Credit	1.0420	0.9976	1.0535	1.0084
	(0.41)	(0.04)	(0.50)	(0.13)
Observations	15,016	41,173	14,150	38,665
R-squared	0.10	0.15	0.10	0.15

** Statistically Significant at 5% level * Statistically Significant at 10% level
Source: October CPS data 1990-2000. Robust z statistics are reported in parentheses. Each model contains year fixed effects and controls for gender, race (dummy variables for black, Asian, and Hispanic), age, marital status, level of education, a dummy variable for being employed, family income (categorical), and the annual unemployment rate, per capita income, and percentage with a baccalaureate degree of the individual's state.

Table 14: The Distribution of Colleges by Region and Pre-Policy List Tuition Level

	*Incentives due to **Price** and **Income** Effects*			*Incentives due to **Income** Effects*	
	≤ $1,000	$1,001 – $2,000	$2,001 – $5,000	$5,001 – $7,500	$7,500+
	Public Two-year Colleges				
New England	--	6	20	1	--
Mideast	--	6	80	--	--
Great Lakes	--	11	85	9	--
Plains	1	37	27	--	--
Southeast	85	143	1	--	--
Southwest	34	52	9	--	--
Rocky Mts	--	29	2	--	--
Far West	50	42	--	--	--
Total	170	326	224	10	--
	Public Four-year Colleges				
New England	--	1	28	4	1
Mideast	--	--	65	25	1
Great Lakes	--	--	72	2	--
Plains	--	4	47	--	--
Southeast	--	32	107	3	--
Southwest	--	24	29	--	--
Rocky Mts	--	8	19	--	--
Far West	--	18	31	--	--
Total	--	87	398	34	2
	Private Four-year Colleges				
Total	--	--	44	90	735

Source: IPEDS data. Tuition levels are for in-state students. The regions are: New England (CT, ME, MA, NH, RI, VT), Mid East (DE, DC, MD, NJ, NY, PA), Great Lakes (IL, IN, MI, OH, WI), Plains (IA, KS, MN, MO, NE, ND, SD), Southeast (AL, AR, FL, GA, KY, LA, MS, NC, SC, TN, VA, WV), Southwest (AZ, NM, OK, TX), Rocky Mountains (CO, ID, MT, UT, WY), Far West (AK, CA, HI, NV, OR, WA).

Table 15: The Distribution of Colleges by Size of State Aid Program

	States with Large Aid Programs *(have incentives to raise Tuition)*		States without Large Aid Programs	
	Public 4-Years	Public 2-Years	Public 4-Years	Public 2-Years
≤ $1,000	0	40	0	130
$1,001 – $2,000	15	5	72	321
$2,001 – $5,000	111	138	287	86
$5,001 – $7,500	25	10	9	0
>$7,500	2	0	0	0
Total	153	193	368	537

Source: NASSGAP 29th Annual Survey, IPEDS data, and the National Center for Education Statistics. "High State Aid" is defined as being ranked as one of the top eight states in 1997-98 in total grant aid or per student aid. However, Georgia, Florida, and New Mexico are excluded because they have large aid programs that cover full tuition for a significant proportion of their students (these states do not have incentives to raise tuition prices as they would have to pay for them out of their own aid program). The states with large aid programs in terms of total expenditures are New York, Illinois, California, Pennsylvania, Georgia, New Jersey, Ohio, and Florida. The states with large aid programs in terms of per student expenditures are Georgia, New York, New Jersey, Illinois, Pennsylvania, New Mexico, Minnesota, and Vermont. These benchmarks were chosen due to the natural break in the amounts of the next highest states.

Table 16a: The State Response to the Tax Credits – By Tuition Price of Colleges
Dependent Variable: Log (State Support for Higher Education)

	Public Two-Year Colleges			Public Four-Year Colleges		
	(1)	(2)	(3)	(4)	(5)	(6)
After	-2.5596**	-1.8011**	-2.9293**	-0.0335	-0.0419	-0.0487
	(0.1292)	(0.1618)	(0.5829)	(0.0548)	(0.0459)	(0.0646)
Many Credit-Eligible Students (Most affected by the introduction of the tax credits)						
Many Credit-Eligible Students	-0.3527**		-0.3843**	0.1466**		0.1423**
	(0.0620)		(0.1397)	(0.0456)		(0.0492)
After * Many Credit-Eligible	0.4042**		1.3299**	-0.0685		-0.0570
	(0.1599)		(0.5984)	(0.0608)		(0.0721)
Low-Tuition (Incentives to reduce support due to student benefit)						
Tuition ≤ $1,000		0.2848**	-0.1007			
		(0.1365)	(0.1852)			
After * Tuition ≤ $1,000		-0.5685**	0.5702			
		(0.2139)	(0.6019)			
Tuition $1,001 – $2,000		0.2307*	-0.0688		-0.0580	-0.0224
		(0.1189)	(0.1775)		(0.0550)	(0.0588)
After * Tuition $1,001 – $2,000		-0.9621**	0.2343		0.0655	0.0485
		(0.1829)	(0.5971)		(0.0780)	(0.0979)
Differences-in-Differences-in-Differences (Many Credit-Eligible and Low-Tuition)						
Tuition ≤ $1,000 * Many Eligible			0.1708			
			(0.1505)			
After * ≤$1,000 * Many Eligible			-1.5105**			
			(0.6393)			
$1,001– $2,000 * Many Eligible			0.4038**			-0.0492
			(0.1834)			(0.1397)
After * $1-$2,000 * Many Eligible			-2.6826**			0.1014
			(0.8102)			(0.1102)
Number of Colleges	705	730	705	513	521	513
Observations	4,935	5,110	4,935	3,591	3,647	3,591
R-squared	0.1748	0.1805	0.1867	0.0594	0.0514	0.0596

** Statistically Significant at 5% level * Statistically Significant at 10% level

Notes: IPEDS data from 1993-94 to 1999-2000. Robust standard errors are shown in parentheses. Monetary amounts are in 2000 dollars. All models include year fixed effects and controls for college selectivity, the region of the college, and state characteristics (annual unemployment rate, annual per capita income, and 1990 percentage of the population with a bachelor's degree). State support for higher education is measured by state appropriations to a college divided by FTE enrollment. Tuition groups are defined based on tuition levels during 1997-98.

Table 16b: The State Response to the Tax Credits – By Region
Dependent Variable: Log (State Support for Higher Education)

	Southeast Region		Southwest Region		Far West Region	
After	-1.2577**	-0.2895**	-2.9170**	-1.4928**	-1.2591**	-0.4104**
	(0.1403)	(0.0995)	(0.2610)	(0.3029)	(0.2101)	(0.1400)
Many Credit-Eligible Students (Most affected by the introduction of the tax credits)						
Many Credit-Eligible Students	-0.0561		-0.1386		0.2066*	
	(0.0649)		(0.1082)		(0.1129)	
After * Many Credit-Eligible	0.0591		-0.2909		-0.2469	
	(0.2184)		(0.4157)		(0.2880)	
Low-Tuition (Incentives to raise tuition due to Price and Income Effects)						
Tuition ≤ $1,000		0.6796**		0.9250**		-0.3925*
		(0.1034)		(0.1496)		(0.2024)
After * Tuition ≤ $1,000		-1.3968**		-2.4325**		-1.3923**
		(0.2267)		(0.3751)		(0.2678)
Tuition $1,001 – $2,000		0.4024**		0.7820**		0.0641
		(0.0960)		(0.1362)		(0.1312)
After * Tuition $1,001 – $2,000		-1.2669**		-1.6312**		-1.1585**
		(0.1659)		(0.3367)		(0.2248)
Number of	365	371	139	148	133	141
Observations	2,555	2,597	973	1,036	931	987
R-squared	0.1327	0.1567	0.3093	0.3391	0.2564	0.2874

** Statistically Significant at 5% level * Statistically Significant at 10% level

Notes: IPEDS data from 1993-94 to 1999-2000. Robust standard errors are shown in parentheses. Monetary amounts are in 2000 dollars. All models include year fixed effects and controls for college selectivity and state characteristics (annual unemployment rate, annual per capita income, and 1990 percentage of the population with a bachelor's degree). State support for higher education is measured by state appropriations to a college divided by FTE enrollment. Tuition groups are defined based on tuition levels during 1997-98.

Table 17: The State Response to the Tax Credits – By Size of State Aid Program
Dependent Variable: Log (State Support for Higher Education)

	Public Two-Year Colleges		Public Four-Year Colleges	
	(1)	(2)	(3)	(4)
After	-2.7689**	-2.6876**	-0.0220	-0.0413
	(0.1131)	(0.1371)	(0.0529)	(0.0661)
States with Large Aid Programs *(Incentives to reduce support to capture federal funds)*				
High Aid State	-0.4049**	-0.5501**	-0.1014	0.0439
	(0.1079)	(0.1453)	(0.0617)	(0.0926)
After * High Aid State	1.5564**	0.9681**	-0.0374	0.0381
	(0.1700)	(0.2999)	(0.0570)	(0.0867)
Many Credit-Eligible Students *(Most affected by the introduction of the tax credits)*				
Many Credit-Eligible Students		-0.2433**		0.2140**
		(0.0676)		(0.0538)
After * Many Credit-Eligible		-0.2344		-0.0438
		(0.1793)		(0.0777)
Differences-in-Differences-in-Differences *(Many Credit-Eligible and Higher State Aid)*				
High Aid * Many Eligible		0.0970		-0.2160**
		(0.1469)		(0.1015)
After * High Aid * Many Eligible		1.0460**		-0.0726
		(0.3654)		(0.1119)
Number of Colleges	730	705	521	513
Observations	5,110	4,935	3,647	3,591
R-squared	0.1925	0.1989	0.0528	0.0652

** Statistically Significant at 5% level * Statistically Significant at 10% level

Notes: IPEDS data from 1993-94 to 1999-2000. Robust standard errors are shown in parentheses. State support for higher education is measured by state appropriations to a college divided by FTE enrollment. Monetary amounts are in 2000 dollars. All models include year fixed effects and controls for college selectivity, the region of the college, and state characteristics (annual unemployment rate, annual per capita income, and 1990 percentage of the population with a bachelor's degree). "High State Aid" is defined as being ranked as one of the top eight states in 1997-98 in total grant aid or per student aid. Georgia, Florida, and New Mexico are excluded because they have large aid programs that cover full tuition, and therefore, do not have the same incentive to raise tuition prices.

Table 18a: Impact of the Tax Credits on Public Colleges by Tuition Price
Dependent Variable: Log (List In-State Tuition Price)

	Public Two-Year Colleges			Public Four-Year Colleges		
	(1)	(2)	(3)	(4)	(5)	(6)
After	-0.0968**	-0.0899**	-0.0854**	-0.1983**	-0.1916**	-0.1667**
	(0.0169)	(0.0194)	(0.0365)	(0.0190)	(0.0165)	(0.0210)
Many Credit-Eligible Students (Most affected by the introduction of the tax credits)						
Many Credit-Eligible Students	0.4353**		0.1954**	0.2862**		0.2586**
	(0.0366)		(0.0261)	(0.0207)		(0.0200)
After * Many Credit-Eligible	0.0016		0.0008	-0.0122		-0.0411
	(0.0229)		(0.0418)	(0.0299)		(0.0312)
Low-Tuition (Incentives to raise tuition due to Price and Income Effects)						
Tuition ≤ $1,000		-1.2201**	-1.0687**			
		(0.0400)	(0.0430)			
After * Tuition ≤ $1,000		0.0556*	0.0415			
		(0.0314)	(0.0432)			
Tuition $1,001 – $2,000		-0.5067**	-0.4053**		-0.3018**	-0.1946**
		(0.0329)	(0.0388)		(0.0202)	(0.0196)
After * Tuition $1,001 – $2,000		-0.0401	-0.0477		-0.0976**	-0.1239**
		(0.0285)	(0.0424)		(0.0388)	(0.0406)
Differences-in-Differences-in-Differences (Many Credit-Eligible and Low-Tuition)						
Tuition ≤ $1,000 * Many Eligible			-0.0357			
			(0.0345)			
After * ≤$1,000 * Many Eligible			0.0193			
			(0.0540)			
$1,001– $2,000 * Many Eligible			0.0856			-0.2480**
			(0.0945)			(0.0423)
After * $1-$2,000 * Many Eligible			0.1790**			-0.0238
			(0.0805)			(0.1627)
Number of Colleges	705	730	705	513	521	513
Observations	4,902	5,067	4,902	3,523	3,574	3,523
R-squared	0.6493	0.7815	0.7991	0.6074	0.5931	0.6519

** Statistically Significant at 5% level * Statistically Significant at 10% level

Notes: IPEDS data from 1993-94 to 1999-2000. Robust standard errors are shown in parentheses. Monetary amounts are in 2000 dollars. All models include year fixed effects and controls for state appropriations per FTE student, college selectivity, the region of the college, and state characteristics (annual unemployment rate, annual per capita income, and 1990 percentage of the population with a bachelor's degree). Tuition groups are defined based on tuition levels during 1997-98.

Table 18b: The College Response to the Tax Credits – By Region
Dependent Variable: Log (List Tuition Price)

	Southeast Region		Southwest Region		Far West Region	
After	-0.0252	-0.1922**	-0.3714**	-0.3751**	-0.0688	-0.1821**
	(0.0181)	(0.0471)	(0.0359)	(0.0414)	(0.0547)	(0.0624)
Many Credit-Eligible Students (Most affected by the introduction of the tax credits)						
Many Credit-Eligible Students	0.3432**		0.3594**		0.5006**	
	(0.0339)		(0.1046)		(0.0648)	
After * Many Credit-Eligible	-0.2328**		0.0078		0.2544**	
	(0.0567)		(0.0908)		(0.0624)	
Low-Tuition (Incentives to raise tuition due to Price and Income Effects)						
Tuition ≤ $1,000		-0.9967**		-1.0226**		-1.6389**
		(0.0496)		(0.0866)		(0.1424)
After * Tuition ≤ $1,000		0.3189**		0.1443**		-0.0132
		(0.0518)		(0.0728)		(0.0750)
Tuition $1,001 – $2,000		-0.3880**		-0.4976**		-0.4909**
		(0.0389)		(0.0664)		(0.0848)
After * Tuition $1,001 – $2,000		0.1087**		-0.0028		0.2249**
		(0.0507)		(0.0777)		(0.0619)
Number of	365	371	139	148	133	141
Observations	2,550	2,588	965	1,022	865	916
R-squared	0.6340	0.7717	0.4772	0.5926	0.7782	0.8966

** Statistically Significant at 5% level * Statistically Significant at 10% level

Notes: IPEDS data from 1993-94 to 1999-2000. Robust standard errors are shown in parentheses. Monetary amounts are in 2000 dollars. All models include year fixed effects and controls for state appropriations per FTE student, college selectivity, and state characteristics (annual unemployment rate, annual per capita income, and 1990 percentage of the population with a bachelor's degree). Tuition groups are defined based on tuition levels during 1997-98.

Table 19: Impact of the Tax Credits on Colleges in High-Aid States
Dependent Variable: Log (List In-State Tuition Price)

	Public Two-Year Colleges		Public Four-Year Colleges	
	(1)	(2)	(3)	(4)
After	-0.1154**	-0.0977**	-0.2402**	-0.2190**
	(0.0159)	(0.0179)	(0.0193)	(0.0212)
Colleges in States with Large Aid Programs *(Incentives to raise tuition to capture federal funds)*				
High Aid State	-0.1911**	-0.6559**	0.0614*	0.0293
	(0.0512)	(0.0958)	(0.0360)	(0.0402)
After * High Aid State	0.0478**	-0.1115**	0.1712**	0.1870**
	(0.0232)	(0.0341)	(0.0233)	(0.0338)
Many Credit-Eligible Students *(Most affected by the introduction of the tax credits)*				
Many Credit-Eligible Students		0.2750**		0.2780**
		(0.0396)		(0.0274)
After * Many Credit-Eligible		-0.0654**		-0.0513
		(0.0293)		(0.0412)
Differences-in-Differences-in-Differences *(Many Credit-Eligible and Higher State Aid)*				
High Aid * Many Eligible		0.7392**		0.0697
		(0.1129)		(0.0427)
After * High Aid * Many Eligible		0.2510**		-0.0234
		(0.0436)		(0.0518)
Number of Colleges	730	705	521	513
Observations	5,067	4,902	3,574	3,523
R-squared	0.5776	0.6967	0.5339	0.6228

** Statistically Significant at 5% level * Statistically Significant at 10% level

Notes: IPEDS data from 1993-94 to 1999-2000. Robust standard errors are shown in parentheses. Monetary amounts are in 2000 dollars. All models include year fixed effects and controls for state appropriations per FTE student, college selectivity, the region of the college, and state characteristics (annual unemployment rate, annual per capita income, and 1990 percentage of the population with a bachelor's degree). "High State Aid" is defined as being ranked as one of the top eight states in 1997-98 in total grant aid or per student aid. Georgia, Florida, and New Mexico are excluded because they have large aid programs that cover full tuition, and therefore, do not have the same incentive to raise tuition prices.

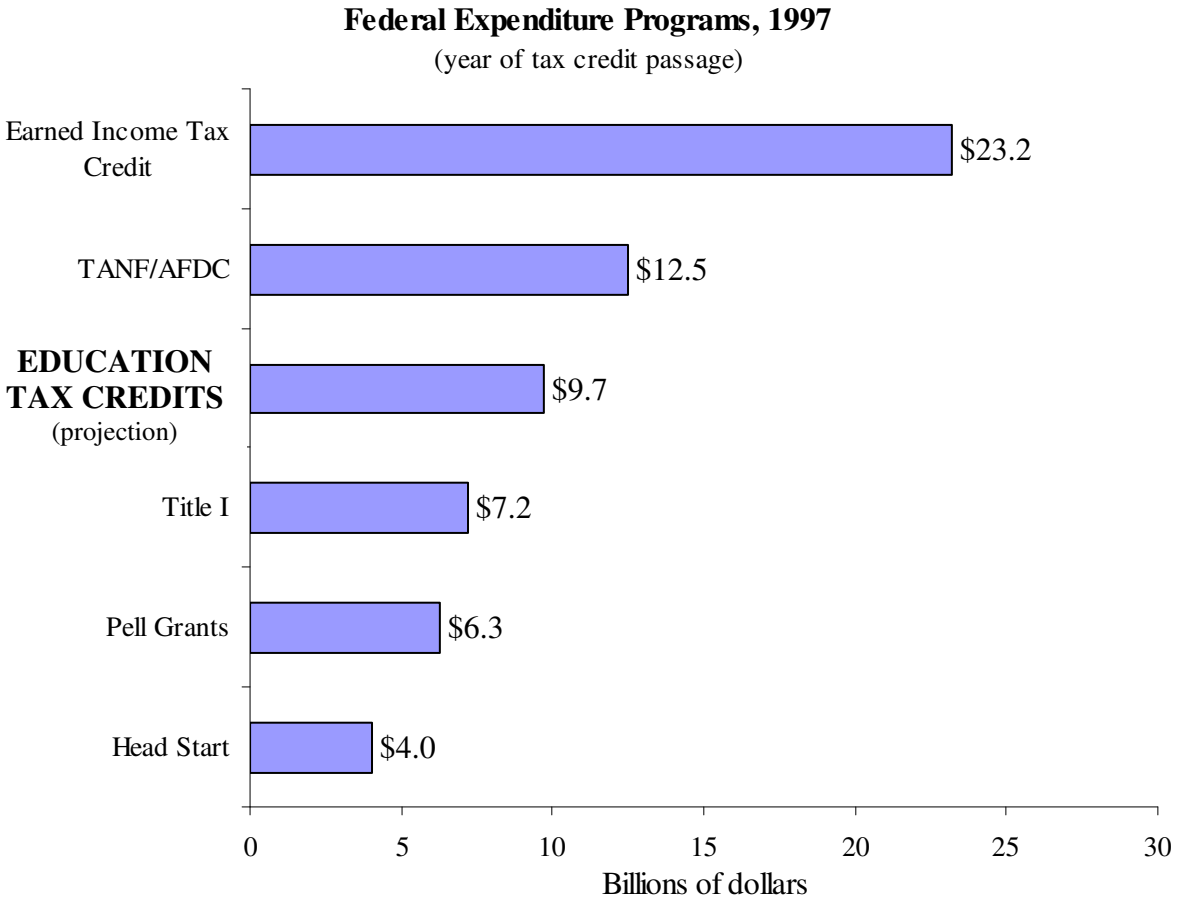
Table 20: Impact of the Tax Credits on Private Four-Year Colleges
Dependent Variable: Log (List In-State Tuition Price)

	(1)	(2)	(3)	(4)	(5)
After	0.0421**	0.0338**	0.0403**	0.0447**	0.0447**
	(0.0112)	(0.0087)	(0.0120)	(0.0101)	(0.0114)
Many Credit-Eligible Students (Most affected by the introduction of the tax credits)					
Many Credit-Eligible Students	0.4369**		0.4107**		0.4592**
	(0.0251)		(0.0229)		(0.0319)
After * Many Credit-Eligible	-0.0273**		-0.0277**		-0.0246*
	(0.0116)		(0.0122)		(0.0131)
Low-Tuition (Incentives to raise tuition due to Price and Income Effects)					
Tuition $2,001–$5,000		-0.8881**	-0.7824**		
		(0.0392)	(0.0450)		
After * Tuition $2,001– $5,000		-0.0242	-0.0221		
		(0.0267)	(0.0316)		
Differences-in-Differences-in-Differences (Many Credit-Eligible and Low-Tuition)					
$2,001– $5,000 * Many Eligible			-0.2983**		
			(0.0614)		
After * $2-$5,000 * Many Eligible			-0.0105		
			(0.0524)		
Colleges in States with Large Aid Programs (Incentives to raise tuition to capture federal funds)					
High Aid State				0.1253**	0.1269**
				(0.0409)	(0.0470)
After * High Aid State				-0.0207	-0.0032
				(0.0154)	(0.0286)
Differences-in-Differences-in-Differences (Many Credit-Eligible and Higher State Aid)					
High Aid * Many Eligible					-0.0638
					(0.0521)
After * High Aid * Many Eligible					-0.0076
					(0.0290)
Number of Colleges	874	937	874	937	874
Observations	6,059	6,483	6,059	6,483	6,059
R-squared	0.4456	0.3716	0.5974	0.2214	0.4505

** Statistically Significant at 5% level * Statistically Significant at 10% level

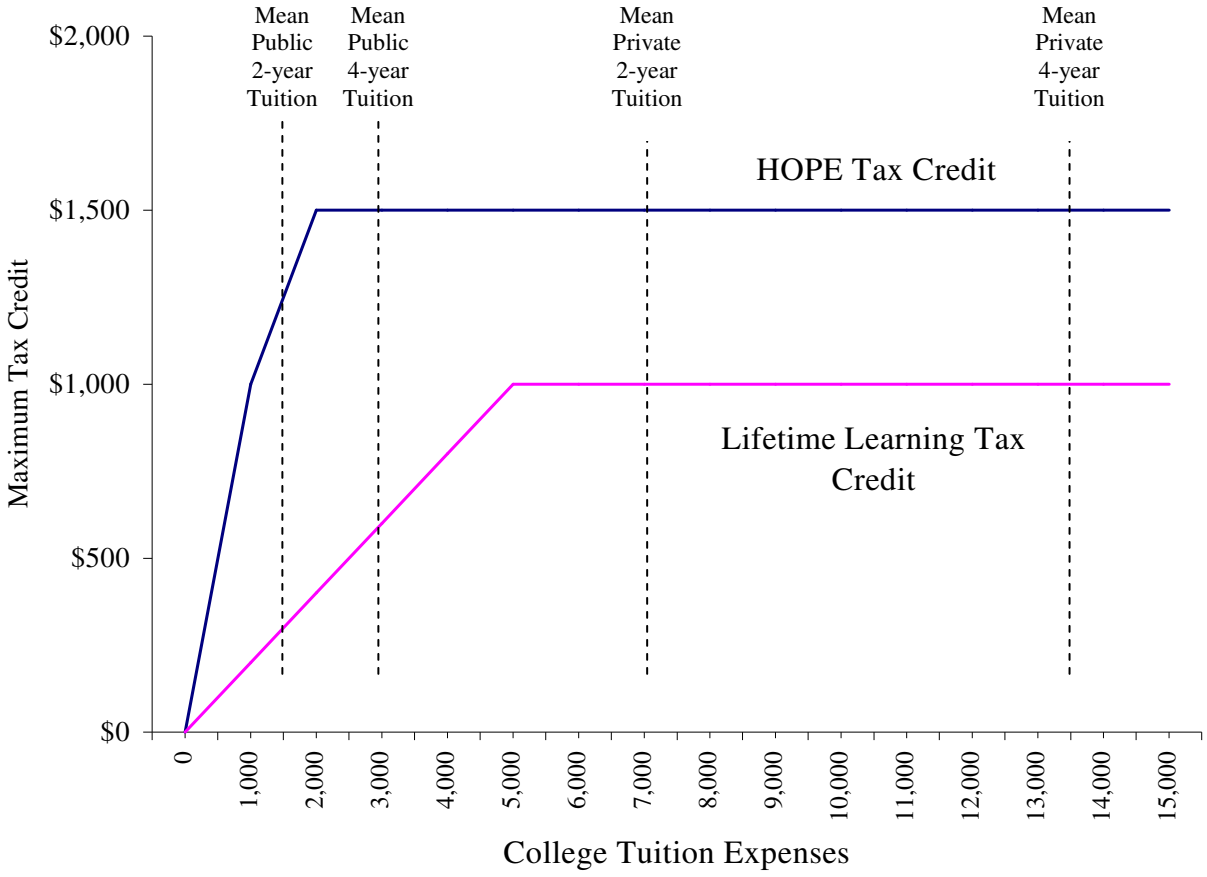
Notes: IPEDS data from 1993-94 to 1999-2000. Robust standard errors are shown in parentheses. Monetary amounts are in 2000 dollars. All models include year fixed effects and controls for college selectivity, the region of the college, and state characteristics (annual unemployment rate, annual per capita income, and 1990 percentage of the population with a bachelor's degree). Tuition groups are defined based on tuition levels during 1997-98. "High State Aid" is defined as being ranked as one of the top eight states in 1997-98 in total grant aid or per student aid. Georgia, Florida, and New Mexico are excluded because they have large aid programs that cover full tuition, and therefore, do not have the same incentive to raise tuition prices.

Figure 1



Notes: The expenditure on higher education tax credits is a projection by the Department of Education based on State-level enrollment, Pell Grant recipient data, and the President's fiscal year 2000 budget policy. Information on the other programs is from the College Board (2001a), NCES (1998) and U.S. Census Bureau (2000).

Figure 2: Tax Credit by College Expense



Notes: Source of tax credit information: U.S. Department of Treasury, Internal Revenue Service (1998c) *Tax Benefits for Higher Education.* Publication 970. In 2003, the maximum LLTC will increase to $2,000. For the 1997-98 school year, the mean tuition cost (enrollment weighted) for a public, two-year college was $1,567, $3,111 for a public, four-year college, $7,079 for a private, two-year college, and $13,785 for a private, four-year college (College Board, 2001b).