Title

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Salience and Inertia in Program Selection

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Abstract: Complexity in the federal tax code is likely to prevent some taxpayers from minimizing their tax liability. Tax-based federal student aid adds to this complexity by requiring that taxpayers select a single program (per student) from a menu of tax incentives. Analyzing a nationally representative panel dataset of individual income tax returns, I find that in roughly 25 percent of returns taxpayers fail to select the tax-minimizing program. While opportunity costs may be a barrier to tax-minimization, the estimated effects of opportunity costs are imprecise so that this implication is unclear. Instead, I find evidence that greater salience of federal tax effects causes some taxpayers to minimize federal tax liability rather than combined state and federal tax liability. For taxpayers claiming the programs in consecutive years, I find that inertia in program selection reduces the probability of selecting the tax-minimizing option, relative to first time users.

JEL Codes: H26, H31, H71

Key words: salience; inertia, default behavior; tax-based student aid

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1. Introduction

Complexity in the federal tax code is likely to prevent some taxpayers from minimizing their tax liability. The literature finds substantial confusion regarding basic attributes of the tax system such as tax rates (de Bartolome 1995) and also with key features of tax programs such as the Earned Income Tax Credit (Saez 2010; Chetty and Saez 2009). Tax-based federal student aid adds an additional layer of complexity for middle class taxpayers by offering a menu of tax credits and deductions to lower the cost of postsecondary education. Taxpayers are often eligible for more than one tax-based aid program, but are restricted to one program per student each year. Many states allow the programs to reduce state taxes, compounding the difficulty of selecting the single option that minimizes combined state and federal tax liability.

To explore how taxpayers select a single program from a menu of tax options, I focus on the choice between two tax-based federal student aid programs, the Tuition Deduction and the Lifetime Learning Tax Credit. I focus on these two programs for several reasons. First, the programs have similar eligibility requirements. A taxpayer selecting the Lifetime Learning Tax Credit can always select the Tuition Deduction and a taxpayer selecting the Tuition Deduction can usually opt for the Lifetime Learning Tax Credit. In contrast, the enrollment requirements of these programs are incongruent with the enrollment requirements of other tax-based aid programs such as the Hope Tax Credit. Second, due to data limitations it is difficult to determine if taxpayers selecting the Hope Tax Credit make the tax minimizing selection.[1] Third, the Lifetime Learning Tax Credit and the

[1] The Hope Tax Credit is available only during the first two years of college, so that a student claiming the Tuition Deduction or the Lifetime Learning Tax Credit may not be eligible for the Hope Tax Credit. As a further complication, the qualified spending limit for the Hope Tax Credit is smaller compared to the other programs and its phase-in rate is larger, so that it is not possible to determine if taxpayers selecting the Hope Tax Credit are minimizing tax liability.

Tuition Deduction represent a majority of tax-based aid use, roughly 70 percent, during the analysis period. [2]

Analyzing a panel dataset of individual income tax returns from the Internal Revenue Service (IRS), I find that a substantial number of taxpayers do not select the program that offers the largest reduction in state and federal taxes between 2002 and 2008. Focusing on taxpayers who claim either the Tuition Deduction or the Lifetime Learning Tax Credit, roughly one out of four returns is not tax-minimizing with respect to the tax-based aid selection. On average, a non-tax-minimizing selection costs these taxpayers about $100 per return ($2008), 25 percent of the value of the tax-minimizing alternative. While the share of non-tax-minimizing returns has decreased over time, in 2008 1 out of 5 tax returns failed to select the tax-minimizing program. Figure 1 shows both the average value of the forgone tax benefit and the share of tax returns claiming either the Tuition Deduction or the Lifetime Learning Tax Credit that is not tax minimizing between 2002 and 2008. Total non-tax-minimizing claims results in $955 million in forgone tax reductions for 9.6 million tax returns during this period. The failure to select the tax-minimizing program has important implications for policy effectiveness. While recent work (Turner 2010; LaLumia 2010) finds that tax-based aid increases enrollment, the failure to select the most valuable option may exacerbate already high student debt burdens.[3]

In this paper, I consider several explanations for why some taxpayers fail to select the tax-minimizing program. Opportunity costs may be a barrier to tax minimization for some taxpayers. Intuitively, high opportunity cost taxpayers may not invest the time required for tax-minimization.

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[2] The Lifetime Learning Tax Credit and Tuition Deduction represent the following shares of total tax-based aid claims: 69 percent in 2002, 70 percent in 2003, 72 percent in 2004, 76 percent in 2005, 72 percent in 2006, 64 percent in 2007 and 75 percent in 2008. Author's calculations from IRS Statistics of Income Estimated Line Counts.

[3] For the 2003-04 and 2007-08 school years, more than one half of all postsecondary students use student loans to finance their education. During these school years, the median debt burden among degree recipients ranged from a low of $4,500 for 2-year certificate degrees to $32,653 for 4-year private school degrees (Steele and Baum 2009).

While I find that taxpayers are responsive to the financial gain from tax minimization, I am unable to determine if high opportunities cost taxpayers are less responsive, compared to low opportunity cost taxpayers. As a result, the role of opportunity costs on tax minimization is unclear. To the extent that opportunity costs deter tax minimization, the estimated responsiveness to the gain from tax minimization reported here represents a lower bound.

I find that taxpayers are more than twice as responsive to a reduction in federal taxes compared to a reduction in state taxes. This result may be evidence that saliency of federal tax effects cause some taxpayers to minimize *federal taxes* rather than *combined state and federal taxes*. Salience effects contrast with standard characterizations of behavior that predict that the source of the gain will not impact taxpayers' decisions. Focusing on more salient federal tax effects, and overlooking less salient state tax effects, reduces the likelihood of selecting the tax-minimizing program by 30-33 percent. The finding of salience effects is consistent with work by Chetty, Looney and Kroft (2009) and Finkeltstein (2009) that suggests consumers focus on more salient prices when making consumption decisions.

For taxpayers claiming the programs in consecutive years, I find evidence of inertia in program selection. Default behavior causes non-tax-minimizing selections when the program that was selected in the prior year is not tax minimizing in the current year. Inertia in program selection reduces the likelihood of selecting the tax-minimizing program by 9-18 percent, relative to taxpayers that did not claim tax-based aid in the preceding year. The finding of inertia effects is consistent with previous studies that find default behavior affects participation in employee savings plans (Choi, Laibson, Madrian and Metrick 2003; Madrian and Shea 2001), and impacts personal income tax withholdings (Jones 2010).

The remainder of the paper proceeds as follows. In the next Section, I discuss the basics of tax-based federal student aid and I explore how opportunity costs, saliency, and inertia in program selection may cause taxpayers to make non-tax-minimizing selections. In Section 3, I describe the data and the econometric method. In Section 4, I discuss the empirical results and in Section 5, I conclude.

2. Tax-Based Federal Student Aid

2.1. Program Details

Tax-based federal student aid offers a unique setting in which to examine how taxpayers select from a menu of overlapping tax incentives. The programs target the middle class by offering a non-refundable tax benefit that is subject to an adjusted gross income limit. The values of the programs depend, in part, on education spending. Many taxpayers are eligible for more than one tax-based aid program, yet are limited to one program per student per year. Eligible taxpayers must choose from among two or three alternatives when deciding which tax-based aid program to select. Eligibility for tax-based aid depends on both adjusted gross income and enrollment. The Lifetime Learning Tax Credit is equal to 20 percent of qualified expenses.[4] Between 1998 and 2002, the qualified spending limit was $5,000, and in 2003 it increased to $10,000 (IRS 1998, 2003). The Tuition Deduction allows tax filers to deduct 100 percent of qualified education expenses up to $3,000 in 2002 and 2003 and up to $4,000 beginning in 2004. Table 1 provides details on the tax-based aid programs. In this paper, I focus on the selection between the Tuition Deduction and the Lifetime Learning Tax Credit, abstracting from the program take-up decision. Maag and Rohaly (2007) and the Government Accountability Office (2005) find program take-up of tax-based aid is

[4] The credit is worth 40 percent of education spending in certain counties in Alabama, Louisiana and Mississippi in 2005 and 2006 as part of the Gulf Opportunity Zone program and also for certain counties in Arkansas, Illinois, Indiana, Iowa, Missouri, Nebraska and Wisconsin in 2008 as part of the Midwestern Disaster Area program.

between 63 and 74 percent, comparable to take-up rates for other tax-based benefit programs such as the Earned Income Tax Credit, or to Unemployment Insurance and Head Start (Currie 2006).

2.2. Program Selection: Opportunity Costs, Saliency and Inertia

When choosing between the Lifetime Learning Tax Credit and the Tuition Deduction, taxpayers will select the tax-minimizing program when the utility they receive from tax-minimization exceeds the utility they would receive if they claim the alternate program. The utility benefit from each program depends on the tax benefit, as well as the cost of claiming the program. Equation (1) shows the net value of the Lifetime Learning Tax Credit and Equation (2) gives the net value of the Tuition Deduction

(1) $$L = 0.2\min(S,\bar{S}_L) - C_L$$

(2) $$T = (\tau)\min(S,\bar{S}_T) - C_T$$

where τ is the (combined state and federal) marginal tax rate, S is actual education spending, $\bar{S}_i$ is the program spending limit and C_i is the cost of claiming each program, for i=T,L for the Tuition Deduction and Lifetime Learning Tax Credit.[5] The cost of claiming a program includes both the required paperwork cost as well as the cost of learning program rules and determining eligibility. For simplicity, assume that education spending is not larger than the limit of the Tuition Deduction so that $S \le \bar{S}_T < \bar{S}_L$ (this issue is discussed further in the empirical section).

When taxpayers know their marginal tax rate and the costs of claiming the programs, selection is straightforward. A utility-maximizing taxpayer will select the Tuition Deduction when the tax benefit (the marginal tax rate minus the phase-in rate) is larger than the difference in the

[5] The programs are non refundable. For simplicity, in (3) and (4) I assume that taxpayers have tax liability that is at least as large their award. In the empirical work, I take tax liability into account when determining the values of the programs.

costs of claiming the programs. This condition is given by the inequality in (3). Alternatively, a taxpayer will select the Lifetime Learning Tax Credit when (3) does not hold.

(3) $$(\tau - 0.2)S > C_T - C_L$$

The selection rule characterized by (3) predicts that utility-maximizing agents will select the tax-minimizing program when the costs of claiming the programs are equal $(C_T = C_L)$. The difference in the paperwork costs associated with claiming the programs is minimal and the IRS directions for each program are of a similar length and complexity, implying that this assumption holds.[6]

In practice, there are several reasons why taxpayers may fail to select the tax-minimizing program. First, taxpayers are likely to be uncertain about their marginal tax rate. Realizing the marginal tax rate, or the gain from selecting the tax-minimizing program, is likely to require an investment of time. Self-prepared taxpayers must weigh the total gain per unit time from tax-minimization against their opportunity cost of time.[7] For taxpayers using paid tax preparation, I assume that the time cost is zero.[8] If the wage rate defines the value of the opportunity cost of time, then (4) gives the condition when opportunity costs will deter tax-minimization

(4) $$\left(\frac{gain}{time}\right) < wage$$

where *gain* is equal to the tax benefit as long as $(C_T = C_L)$, and *time* represents the hours required for tax-minimization.

[6] For example, in 2008 claiming the Lifetime Learning Tax Credit required lines 3-17 on tax form 8863, while claiming the Tuition Deduction required lines 1-6 on tax form 8917. The directions for each program in 2008, given in IRS 970, are 6 pages (19-25) for the Lifetime Learning Tax Credit and 5 pages (36-41) for the Tuition Deduction.

[7] Some taxpayers may incur a cost greater than the gain ex post. This is a variant of the "regress" problem described in Conlisk (1996). Johansen (1977) suggests that, "At some point a decision must be taken on intuitive grounds." I follow Chetty, Looney and Kroft (2007) by assuming that agents have solved similar problems previously and apply a given rule of thumb.

[8] I spoke with several paid preparers, all of whom indicated that they do not charge an additional fee for claiming tax-based aid.

A second reason that taxpayers may fail to select the tax-minimizing program is the greater salience of federal tax effects. Federal tax effects are likely to be more salient than state tax effects because federal tax effects are the result of an active choice by taxpayers. In contrast, state tax effects are passively incorporated when states use federal adjusted gross income or federal taxable income as the starting point for calculating state taxes. As a result, some taxpayers may be unaware of state tax implications.[9] Focusing on more salient federal tax effects will cause some taxpayers to select the Lifetime Learning Tax Credit because it offers a larger reduction in *federal tax liability* even though the Tuition Deduction offers a larger reduction in *combined state and federal tax liability*.[10] The inequality in (5) gives this condition when the costs of claiming the programs are equal $(C_T = C_L)$

(5) $$(\tau_F + \tau_S)S > 0.2S > \tau_F S$$

where τ_F and τ_S are the federal and state tax rates. The left inequality in (5) shows that the combined state and federal tax benefit of the Tuition Deduction exceeds the tax benefit of the Lifetime Learning Tax Credit. The right inequality in (5) shows that the Lifetime Learning Tax Credit offers a larger reduction in federal taxes. Tax preparation software may contribute to program selection based on federal tax effects. I find that 2 out of the 3 most popular software programs select the tax-based aid option that minimizes federal tax liability rather than combined state and federal tax liability (see Appendix for details).

Inertia in program selection may also result in non-tax-minimizing selections. Facing complex and opaque program rules, taxpayers who claim tax-based aid in consecutive years may perpetuate their previous selection even when it is not tax minimizing in the current year. Claiming

[9] There is no mention of state tax effects in IRS publication 970, Tax Benefits for Education (2005).
[10] Salience effects are unlikely to result in a non-tax-minimizing Tuition Deduction. This is the result of the state tax treatment of the tax-based aid programs. The Tuition Deduction lowers state taxable income in 31 states, whereas two states allow the value of the Lifetime Learning Tax Credit against state tax liability.

a program in consecutive years is likely to be a relatively less costly option because taxpayers can consult last year's tax return, or utilize tax preparation software that populates the tax return based on prior returns. Formally, let $C_i = C_i^* + C_i^F$ be the cost of claiming a given program where C_i^* represents the paperwork cost, or marginal cost, of claiming the programs and C_i^F represents a fixed cost associated with learning the eligibility requirements and/or program rules. Taxpayers claiming the programs in consecutive years incur only the paperwork cost, and thus face a lower cost compared to first time claimants. Assuming that the paperwork costs are equal for both programs $\left(C_T^* = C_L^*\right)$, (6) gives the condition when a taxpayer who selected the Tuition Deduction will perpetuate their selection even though it is not tax minimizing in the current period. An analogous condition, given by (7), holds for a taxpayer who selected the Lifetime Learning Tax Credit in the prior period.

(6) $\tau S > 0.2S - C_L^F > \tau S - C_T^F$

(7) $0.2S > \tau S - C_T^F > 0.2S - C_L^F$

As shown in (6) and (7), the fixed costs $\left(C_i^F\right)$ define a range over which utility-maximizing taxpayers who have claimed one of the programs previously are deterred from selecting the tax-minimizing program in the current period.

3. Empirical Method

3.1. Individual Income Tax Return Edited Panel Data

To empirically examine selection of the Lifetime Learning Tax Credit and the Tuition Deduction, I use the Continuous Work History Sample from the IRS. This nationally representative data set is constructed by the Statistics of Income Division of the IRS to facilitate research on the operation of

the federal tax code. Selection into the sample is based on the last 4 digits of the primary taxpayer's Social Security number. Beginning in 1999, 5 Social Security endings are included. All primary taxpayers with the selected Social Security number are included in each year that they file a federal tax return. Tracking the primary taxpayer may result in a gender bias, because most primary taxpayers are men.[11] As a robustness check of this source of bias, I limit the sample to taxpayers who do not alter their tax filing status over the analysis period.

To create the analysis sample, I limit the Continuous Work History Sample in several ways. First, I include only the years 2002-2008, when both the Tuition Deduction and the Lifetime Learning Tax Credit are available. Second, in each year I limit the sample to tax returns claiming either the Lifetime Learning Tax Credit or the Tuition Deduction, and that are eligible to claim both programs. This limitation allows me to determine the value of the alternate program, and as a result to determine if the program selected is tax minimizing. This step removes dependent taxpayers, married couples that file separate returns, and taxpayers filing a 1040EZ, as these returns are ineligible for tax-based aid. Third, I remove the small number of returns that claim more than one tax-based aid program in a given year. Including these returns complicates the analysis because the value of each program is calculated per return rather than per student. Fourth, I remove returns that owe zero taxes using either the Lifetime Learning Tax Credit or the Tuition Deduction, because in this case both programs are tax minimizing. I show the resulting sample sizes from each of these restrictions in Appendix A2.

The resulting analysis sample includes 21,126 tax returns, composed of 11,704 unique primary taxpayers. Accounting for the 1 in 2,000 chance of selection into the sample, the returns

[11] Women will be removed from the sample if they are the secondary taxpayers in two ways. First, if a couple separates and files non-jointly only the male taxpayer is included in later years of the sample. Second, if a single woman is included in the sample and she subsequently marries and files a joint return with her husband, she will not appear in the sample after filing a joint return (unless her husband is included in the sample as a primary taxpayer).

represent 42 million tax returns and 23 million unique primary taxpayers.[12] This analysis sample captures about 75 percent of total Tuition Deduction and Lifetime Learning Tax Credit use during the analysis period. Table 2 shows characteristics of the tax returns in the sample. Column (1) shows mean values for the entire sample. On average, returns in the sample select the tax-minimizing program. The value of the program claimed ($639) exceeds the value of the alternate program ($372). By definition, the value of the program claimed ($739) exceeds the value of the alternate option ($364) for tax-minimizing taxpayers in Column (2). In contrast, taxpayers in Column (3) do not select the tax-minimizing program. The value of the program claimed by these taxpayers ($301) is $99 less than the value of the alternate program ($400). Tax-minimizing returns have on average higher income, owe more in federal taxes, and realize a larger refund, relative to non-tax-minimizing returns [Column (4) reports the |t|-statistic of the test that values in Column (2) equal values in Column (3)]. Receipt of a larger federal refund may be evidence that taxpayers in Column (2) are more sophisticated. On the other hand, realizing a larger refund also implies that taxpayers in Column (2) make a larger overpayment of taxes. Tax-minimizing returns are not systematically more complex, relative to non-tax-minimizing returns. As measured by several indicators of tax return complexity, including the use of tax forms (1040, Schedule B, Schedule C), claiming the standard deduction, use of paid tax preparation, and other tax deductions (IRA and student loan deductions), taxpayers in Column (2) are similar to taxpayers in Column (3). The bottom panel of Table 2 shows evidence of persistence in tax-minimizing selections. Taxpayers in Column (2) are more likely to have selected the tax-minimizing program in the prior period, compared to taxpayers in Column (3). A similar pattern holds for the failure to minimize taxes, as

[12] There are 5 combinations of the last 4 digits of the primary taxpayer's Social Security number included in the Continuous Work History Sample beginning in 1999. There are a total of 10^4 (10,000) combinations of these 4 digits, so that the likelihood of selection into the sample is 1 in 2,000.

taxpayers in Column (3) are more likely to have selected a non-tax-minimizing claim in the prior period.

3.2. Econometric Specification

I estimate the determinants of tax-minimization on both the entire sample of returns and also separately for two subsamples: one, the sample of returns for which the Tuition Deduction is tax-minimizing; and two, the sample of returns for which the Lifetime Learning Tax Credit is tax-minimizing. Program rules and characteristics of the tax return, including tax liability, the marginal tax rate, adjusted gross income, and state tax treatment of tax-based aid determine which program is tax-minimizing. Tax salience, inertia in program selection and other determinants of tax minimizing behavior may impact the two sub-samples differently. If these effects are of opposite sign across the subsamples, then pooled estimation will not accurately capture their impact on tax-minimization.

I use the probit model in Equation (8) to estimate the determinants of tax-minimization.

$$(8) \qquad P(TM=1)_{it} = \Phi\left(\beta_1 Gain_{it} + \beta_2 Z_{it} + \beta_3 X_{it} + \varepsilon_{it}\right)$$

The left-hand side of (8) is the probability that a taxpayer selects the tax-minimizing program (*TM=1*), where *i* denotes tax unit and *t* year. The first independent variable is the gain from tax minimization, measured in $100s ($2008). For returns that select the tax-minimizing program, the gain is the difference of the program taken, minus the value of the alternate (non-tax-minimizing) program. For returns that are non-tax-minimizing, the gain is equal to the value of the alternate (tax-minimizing) program less the value of the program taken. I calculate the value of the alternate program using the level of spending implied by the program that is claimed. This step may result in an underestimate of the potential Lifetime Learning Tax Credit for taxpayers selecting the Tuition

Deduction because the spending limit for the credit is larger compared to the deduction.[13] To determine the value of the program claimed, and the value of the alternate program, I use the *TaxSim* tax calculator described in Feenberg and Coutts (1993).[14] Figure 2 shows the distribution of the combined state and federal gain from selecting the tax-minimizing program. The top panel shows returns that select the tax-minimizing program and the bottom panel shows the gain for returns that are not tax minimizing. Consistent with standard theory, Figure 2 implies a positive relationship between the gain from tax-minimization and selecting the tax-minimizing program.

To explore the role of opportunity costs, I estimate Equation (8) after splitting the sample into high opportunity cost taxpayers and low opportunity cost taxpayers. High opportunity cost taxpayers may not invest the time needed for tax minimization. I use the condition in (4) to determine if a taxpayer has a high or low opportunity cost. I define the wage rate as adjusted gross income divided by 2,000 hours (40 hours per week times 50 weeks per year) for non-joint returns. For joint returns, I divide by 3,200 hours to account for the presence of two taxpayers based on estimates of Yau, Gurka and Sailer (2003) who show that roughly 60 percent of joint returns have two wage earners in an earlier period. I also assume that tax planning for tax-based aid requires 2 hours, although the results are similar if I use 1 or 3 hours.[15]

To determine if federal tax effects are more salient than state tax effects, I replace the combined gain variable with separate variables for state and federal tax effects. Unlike the combined gain variable that is positive by definition, its components, may be greater than or less

[13] Roughly 14 percent of taxpayers claiming the Tuition Deduction claim the maximum value. I also consider the possibility that these students will have maximum spending for the Lifetime Learning Tax Credit. This leads to similar empirical results, but may overstate the rate of non-tax-minimization.
[14] The version of *TaxSim* that I use includes 22 variables to estimate federal and state tax effects. The results are very similar when I use the *IncTaxCalc* program described in Bakija (2009).
[15] The IRS estimates that total tax planning for non-business tax filers should take 2.5 hours (see 2005 IRS 1040 instructions page 79). The time investment required will be correlated with the wage if taxpayers with high levels of human capital have both high wages and require less time to identify the tax minimizing program. Unfortunately, there is limited data on taxpayer characteristics, such as educational attainment, that would allow me to identify high human capital taxpayers.

than zero. (The combined gain variable is the sum of the state and federal tax effects.) Greater responsiveness to federal tax effects may be interpreted as evidence that taxpayers focus on more salient federal tax implications when making program selection decisions. To further quantify the effects of federal tax saliency, I also add an indicator variable (*Non-Tax-Minimizing Federal Salience Effect*) that is equal to one for tax returns that would select the non-tax-minimizing selection if they focused solely on federal tax effects. This condition is given in (5). By definition, when this variable is equal to zero the program that minimizes federal tax effects also minimizes combined state and federal tax effects. As a result, the *Non-Tax-Minimizing Federal Salience Effect* variable measures the extent to which focusing on federal tax effects leads to non-tax-minimizing claims. Generally, the program that minimizes federal tax liability fails to minimize combined taxes only when the tax-minimizing program is the Tuition Deduction. This is a result of the state tax treatment of tax-based aid. Thirty-one states allow the Tuition Deduction to lower state taxes, whereas only two states allow the Lifetime Learning Tax Credit to lower state tax liability. Therefore, the *Non-Tax-Minimizing Federal Salience Effect* variable should not have a substantive effect among returns for which the Lifetime Learning Tax Credit is tax minimizing, although I include the variable for this sample as a falsification test.

To examine the role of default behavior in program selection, Z includes indicator variables for tax-based aid use in the previous year. I control for both previous use of the Tuition Deduction and Lifetime Learning Tax Credit and whether the prior selection was tax minimizing (*Minimizing Tuition Deduction, Minimizing Lifetime Learning Tax Credit, Non-minimizing Tuition Deduction, Non-minimizing Lifetime Learning Tax Credit*). I also include an indicator variable for the use of the Hope Tax Credit in the preceding period. It is not possible to determine if this selection is tax minimizing. No tax-based aid use in the previous year is the omitted category.

In *X*, I control for features of the tax unit that may also affect program selection. I include flexible adjusted gross income controls (linear and squared terms). I control for the number of dependents (indicators for 1, 2, 3+), Census Division of residence (indicator variables), tax forms that are included in the tax return (indicators for 1040, standard deduction, schedule B, and schedule C), the use of other deductions (indicator variables for use and values of IRA and student loan deductions) and paid tax preparation (indicator variable).[16] To address time effects, I include a squared time trend. I also cluster the standard errors at the primary taxpayer level.

4. Empirical Results

4.1. Combined State and Federal Gain and Tax Minimization

Consistent with standard characterizations of behavior, and the inequality in (3), the empirical results suggest that taxpayers are responsive to the gain from tax minimization. As shown in the top panel of Column (1) in Table 3, a $100 increase in the gain from minimization increases the likelihood of tax minimization by 4.4 percentage points (6 percent). All empirical results in Tables 3-6 are average marginal effects from a probit specification. Column (1) shows the results for the entire sample, Column (2) limits the sample to returns for which the Tuition Deduction is tax minimizing, and Column (3) limits the sample to returns for which the Lifetime Learning Tax Credit is tax minimizing. Taxpayers in these subsamples are also responsive to the gains from tax minimization. The estimates imply an effect of 4 percentage points (6 percent) in Column (2) and 2 percentage points (3 percent) in Column (3) in response to a $100 gain from tax minimization.

The estimated effect of paid tax preparation shows why it is important to split the sample based on which program is tax minimizing. Paid tax preparation has a substantively small effect for

[16] The control group includes all self-prepared returns, including those that use tax preparation software. It is difficult to identify tax software use. In Appendix A1, I discuss one approach for identifying self-prepared returns that use tax preparation software.

the entire sample, -0.3 percentage points (0.4 percent). However, this effect masks offsetting effects in Columns (2) and (3). Paid tax preparation *decreases* the likelihood of tax-minimization by 10 percentage points (15 percent) in Column (2). In Column (3), paid tax preparation *increases* the probability of tax minimization by 5 percentage points (7 percent). This pattern suggests that paid tax preparers favor the Lifetime Learning Tax Credit, both when it is tax minimizing in Column (3) and when it is not in Column (2).[17] The lower panels in Table 3 show the effects of select control variables on the likelihood of tax minimization. Although many of these variables are significantly different for tax-minimizing returns compared to non-tax-minimizing returns (see Table 2), these variables generally have a substantively small effect on the probability of minimization.

4.2. Opportunity Costs and Tax Minimization

To address the role of opportunity costs, I split the sample of self-prepared tax returns into high and low opportunity cost taxpayers. Using the inequality in (4), I define high (low) opportunity cost taxpayers as having a wage that is greater (less) than the gain per hour from selecting the tax-minimizing program. Panel A of Table 4 shows the results for high opportunity cost taxpayers and Panel B shows the results for low opportunity cost taxpayers. Unfortunately, the results in Panel A are imprecise, so that it is unclear if high opportunity cost returns are less responsive to the financial gain from tax minimization relative to low opportunity cost returns in Panel B. Similarly, differences in the rates of tax minimization and the gains from tax-minimization across these panels do not clarify the role of opportunity costs. For example, in Column (1), 68 percent of high opportunity cost taxpayers select the tax-minimizing program, compared to 81 percent of low

[17] In Column (2) the sample is restricted to returns for which the Tuition Deduction is tax minimizing. Among these returns, a decrease in the likelihood of claiming a Tuition Deduction can also be interpreted as an increase in the probability of selecting a Lifetime Learning Tax Credit. A similar interpretation extends to Column (3), where the sample is restricted to returns for which the Lifetime Learning Tax Credit is tax minimizing. For these returns, a decrease in the likelihood of claiming a Lifetime Learning Tax Credit may also be interpreted as an increase in the probability of selecting a Tuition Deduction.

opportunity cost taxpayers, suggesting that opportunity costs are a barrier for some returns. Yet, the finding that 68 percent of high opportunity cost taxpayers in Column (1) make the tax minimizing selection for an average gain of only $11 implies that many high cost taxpayers are not deterred from selecting the tax-minimizing program despite a relatively small gain.[18] For the remaining analysis, I include the entire sample of taxpayers. To the extent that opportunity costs limit tax minimization, the inclusion of high opportunity cost taxpayers works against finding a substantive response to the gain from tax minimization.

4.3. Salience Effects and Tax Minimization

Taxpayers are more responsive to federal tax effects, compared to state tax effects. This differential sensitivity is consistent with the idea that taxpayers focus on more salient federal tax effects when selecting between the programs. Panel A of Table 5 shows the results for federal and state tax effects separately. Column (1) shows the results for the entire sample, while the sample is limited to returns for which the Tuition Deduction [Lifetime Learning Tax Credit] is tax minimizing in Column (2) [Column (3)]. I cannot reject greater sensitivity to federal tax effects, relative to state tax effects, for any of these samples. Greater responsiveness to federal tax effects will lead some taxpayers in Column (2) to select a non-tax-minimizing Lifetime Learning Tax Credit. To quantify this effect, in Panel B I add an indicator variable (*Non-Tax-Minimizing Federal Salience Effect*) that is equal to one when the program that minimizes federal tax effects is not the program that minimizes combined state and federal taxes. As shown in Columns (1) and (2) of Panel B, the estimated effect of this variable suggests that salience of federal tax effects reduces tax

[18] As an alternate approach, I also split the sample of self-prepared taxpayers into high and low opportunity cost returns based solely on the wage. I define high opportunity cost taxpayers as having a wage greater than or equal to the 75th percentile ($21.21), and low opportunity cost returns as having a wage less than the 75th percentile. Using this approach, I cannot reject equal responsiveness to the gains from minimization for high and low opportunity cost taxpayers. (The estimates for both high and low opportunity cost taxpayers are statistically significantly greater than zero.) This similarity may be evidence that opportunity costs do not deter tax minimization. These results are available from the author upon request.

minimization by 24-27 percentage points (30-33 percent), relative to when salience effects lead to a tax-minimizing selection.[19] As expected, the *Non-Tax-Minimizing Federal Salience Effect* variable has substantively smaller effect in Column (3), where focusing on federal tax effects nearly always leads to the tax-minimizing selection.

4.4. Default Behavior and Tax Minimization

For taxpayers who claim tax-based aid in consecutive years, previous decisions impact current program selections. Panel A of Table 6 reports the estimated effects of the previous tax-based aid use variables.[20] As shown in Column (1), both tax minimizing and non-minimizing behavior is likely to be repeated, consistent with inertia in program selection. The cleanest tests of default behavior come from taxpayers transitioning across tax-based aid programs. Consider taxpayers who selected a tax-minimizing Lifetime Learning Tax Credit in the prior period, but for whom this selection is no longer tax minimizing. As shown in Column (2), these taxpayers are 11 percentage points (18 percent) less likely to select a tax-minimizing Tuition Deduction in the current period, relative to taxpayers who did not use tax-based aid in the preceding year.[21] Similarly, taxpayers who selected a tax-minimizing Tuition Deduction in the prior period, but for whom this selection is no longer tax minimizing also exhibit default behavior. As shown in Column (3), these taxpayers are 7 percentage points (9 percent) less like to select a tax-minimizing Lifetime Learning Tax Credit compared to first-time tax-based aid users.[22] Another test of default behavior comes from taxpayers who transition from the Hope Tax Credit, which is available for only two years. The Lifetime Learning Tax Credit and the Hope Tax Credit share an application form (IRS 8863). As a result,

[19] In Panel A (Panel B), the average dependent variable is 0.82 (0.79) when the *Non-tax-minimizing Federal Salience Effect* variable is equal to zero.
[20] The variables measure tax-based aid use in the prior period. I find similar effects when I include variables for use in any previous period.
[21] The average dependent variable for first-time users in Column (2) is 0.60.
[22] The average dependent variable for first-time users in Column (3) is 0.77.

the Lifetime Learning Tax Credit may be seen as the default option for taxpayers who previously claimed a Hope Tax Credit. The results suggest that inertia from this common application exists. Taxpayers transitioning from the Hope Tax Credit are more likely to select the Lifetime Learning Tax Credit, both when it is tax minimizing in Column (3) and when it is not in Column (2). While coefficients on the remaining lagged use variables are consistent with default behavior, they are harder to interpret as clean tests of inertia effects. For example, repeated selection of the tax-minimizing program may be driven by inertia, or it may be the result of careful tax planning.

4.5. Additional Results

While default behavior may explain tax-based aid selections for taxpayers claiming the programs in subsequent years, it does not offer an explanation of program selection for first time users. To explore the initial decision, I limit the sample to first-time tax-based aid claimants in Panel B of Table 6. Salience effects have a strong effect on program selection for these taxpayers. First-time tax-based aid users are more responsive to the federal tax effect than to the state tax effect from tax minimization. Focusing on federal tax effects has a strong negative effect for first-time users, as identified by the *Non-Tax-Minimizing Federal Salience Effect* variable. Together with the findings in Panel A, these results imply that salience effects steer some taxpayers towards non-tax-minimizing selections, and that these selections are perpetuated over time as a result of default behavior.

I find further evidence of salience and inertia effects from several robustness tests. First, I find salience and inertia effects are present when using different income controls, including cubic spline functions, and higher order polynomial functions of income (the baseline specification includes income and income squared terms). Second, the results are robust to limiting the sample to low opportunity cost self-prepared returns. The similarity of these results, relative to the entire

sample of returns, may be evidence that opportunity costs are not a strong barrier to tax minimization. Third, I find that the results are not substantively affected when the sample is limited to the years 2002-2005. Changes in the application for the Tuition Deduction in 2006 and in 2007 may have altered the composition of returns claiming tax-based aid in these later years. Fourth, I find that the results do not change when the sample is limited to taxpayers who do not alter their tax-filing status during the analysis period. The similarity of these results, compared to the results from the full sample, suggests that there is not a substantive gender bias from tracking the primary taxpayer.

5. Conclusion

Facing overlapping eligibility and a complex interaction of state and federal tax effects, many taxpayers select a tax-based aid program that provides a relatively smaller reduction in combined state and federal tax liability. In this paper, I find evidence that greater salience of federal tax effects causes some taxpayers to minimize their taxes with respect to federal liability, rather than with respect to combined state and federal tax liability. The results suggest that focusing on more salient federal tax effects, rather than less salient combined state and federal tax effects, reduces the probability of tax minimization by 30-33 percent. This result is consistent with Chetty, Looney and Kroft (2009) and Finkelstein (2009) showing that price saliency affects consumer demand, and with Jones (2010) who finds that adjustments to personal income tax withholdings depend on the saliency of income changes. I also show that inertia in program selection causes some taxpayers to make non-tax-minimizing selections. I find that momentum in program selection decreases the probability of tax-minimization between 9 and 18 percent. Such default behavior is consistent with

findings by Madrian and Shea (2001) and Choi, Laibson, Madrian and Metrick (2003) in the context of employee savings plans and also with taxpayer behavior reported by Jones (2010).

These findings have several important policy implications. First, the results suggest that offering a complex menu of overlapping programs diminishes the likelihood that beneficiaries realize their maximum statutory benefit. Streamlining the existing set of programs into a single coherent option is likely to increase tax-based aid awards for many students and families. This implication is consistent with previous work on tax incentives for higher education (Davis 2002; Dynarski 2004; Dynarski and Scott-Clayton 2006). Second, greater responsiveness to more salient tax federal effects suggests policymakers can trade off program salience and program value in order to achieve the desired behavioral response. Third, the evidence of default behavior suggests that inert taxpayers are likely to perpetuate other tax decisions. In terms of crafting new tax policies, inertia effects imply that offering taxpayers new program options may not result in the desired policy outcome, as many taxpayers will maintain their initial program selections.

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NOT FOR PUBLICTION

Appendix

A1. Program Selection by Online Tax Preparation Software and Paid Tax Preparers

To investigate how popular tax preparation software handles the decision between the Lifetime Learning Tax Credit and the Tuition Deduction, I prepared 2009 tax returns using free online versions of three popular tax programs: Turbo Tax, H&R Block Tax at Home and Tax ACT. These are the three highest rated tax software options according to the "Top 10 Reviews" website (http://tax-software-review.toptenreviews.com/). I used two different scenarios. One, I considered a case with only federal tax effects. Two, I considered a case where both state and federal tax effects impact program selection. For each program, I filled in all information on the return and checked for errors using review features of the programs.

In the first scenario, I prepared a married joint-filing return from a state with no personal income tax (New Hampshire). I selected taxpayer characteristics so that the tax-minimizing selection was the Tuition Deduction. I gave the return wage earnings of $90,000, claimed only 2 personal exemptions ($7,300) and took the standard deduction ($11,400). I added no additional income, so that federal taxable income was $71,300. This placed the return in the 25 percent tax bracket (lower bound is $67,900). I also assigned the return $2,000 of education spending. Under this scenario, the value of the Lifetime Learning Tax Credit is $400 (0.2*$2,000) and the value of the Tuition Deduction is $500 (0.25*$2,000). One out of three programs failed to make the tax-minimizing selection.[23]

[23] The software making the non-tax-minimizing choice offered the following advice (name of program is replaced with PROGRAM): Which education deduction or credit should I claim? That's easy. PROGRAM handles it all for you. After you answer the Interview questions about your income and education expenses, the PROGRAM Education Optimizer calculates the education credits and deduction for you and selects the combination that saves you the most money.

In the second scenario, I prepared a married joint-filing return so that tax minimization with respect to federal tax liability would result in the Lifetime Learning Tax Credit and tax minimization with respect to combined state and federal taxes would result in the Tuition Deduction. I gave the return wage earnings of $76,000, claimed only 2 personal exemptions ($7,300) and took the standard deduction ($11,400). I added no additional income, so that federal taxable income was $57,300. This placed the return in the 15 percent federal tax bracket (lower bound is $16,700). I also assigned the return $2,000 of education spending. I gave the return residency in Idaho. Idaho taxable income was $57,300. This placed the return in the 7.8 percent state tax bracket. Under this scenario, the value of the Lifetime Learning Tax Credit is $400 (0.2*$2,000). With respect to only federal tax effects, the value of the Tuition Deduction is $300 (0.15*$2,000). When state tax effects are included the value of the deduction is $456 ((0.15+0.078)*$2,000). Two programs made the non-tax-minimizing decision to take the Lifetime Learning Tax Credit. One of these programs also made the non-minimizing decision in the absence of state tax effects. For the second program, the help feature explicitly states that the program maximizes the *federal* tax benefit of tax-based aid and suggests that the taxpayer may achieve a better result by changing from the default selection.[24]

Unfortunately, in the data it is not possible to identify taxpayers that use tax preparation software. However, returns that claim a tax preparation deduction in prior years and that have no history of using a paid tax preparer are likely candidates for using tax preparation software. (Note that only returns that itemize can include a tax preparation deduction.) Using this approach to

[24] The program's help feature offered the following advice: "An effort is made to maximize the federal tax benefit for the qualifying expenses using the tuition deduction; the lifetime learning credit; and, if the student qualifies, the American opportunity credit or the Hope credit. Later, if you desire, you may try alternative tax benefit treatments for a student other than the automatically selected one. In some cases this will enable you to maximize the total tax benefit between the federal return and a state return."

identify likely tax software users, I find that rate of tax minimization is similar among these taxpayers compared to the full sample. The dollar value of the loss from failing to select the tax minimizing selection is also similar to the full sample.

I also spoke with several paid tax preparers, all of whom use professional level tax software from Drake or UltraTax to prepare returns. The cost of professional tax preparation software is substantially more than the three consumer level tax programs mentioned above. (Cost of the professional tax packages ranged from $1,100-$4,000 compared to roughly $50 for the three consumer programs.) All of the paid preparers were confident that their programs properly incorporated state tax effects, leading to the tax-minimizing selection. None of the preparers were surprised to hear that popular online tax software resulted in non-tax-minimizing selections. One preparer had encountered non-minimizing program selection by one of his clients who used tax preparation software. This preparer reviewed a tax return prepared by one of the three programs mentioned earlier and found that the taxpayer had failed to select the most valuable program. Correcting this mistake in both the current tax year and in previous tax years by filing amended returns resulted in a $6,500 reduction in taxes for the taxpayer.

A2. Details of Analysis Sample from Continuous Work History Sample Data

This section gives the number of tax returns that result from limitations imposed on the full Continuous Work History Sample. All samples include only observations from the 50 U.S. states and the District of Columbia.

Full CWHS Sample 2002-2008: 461,968

Remove returns that do not claim either the Lifetime Learning Tax Credit or the Tuition Deduction: 28,848

Remove returns claiming more than one tax-based aid program: 26,965

Remove returns that are not eligible for both the Lifetime Learning Tax Credit and the Tuition Deduction: 22,442

Remove returns that are non-taxable claiming either the Lifetime Learning Tax Credit or the Tuition Deduction: 21,126

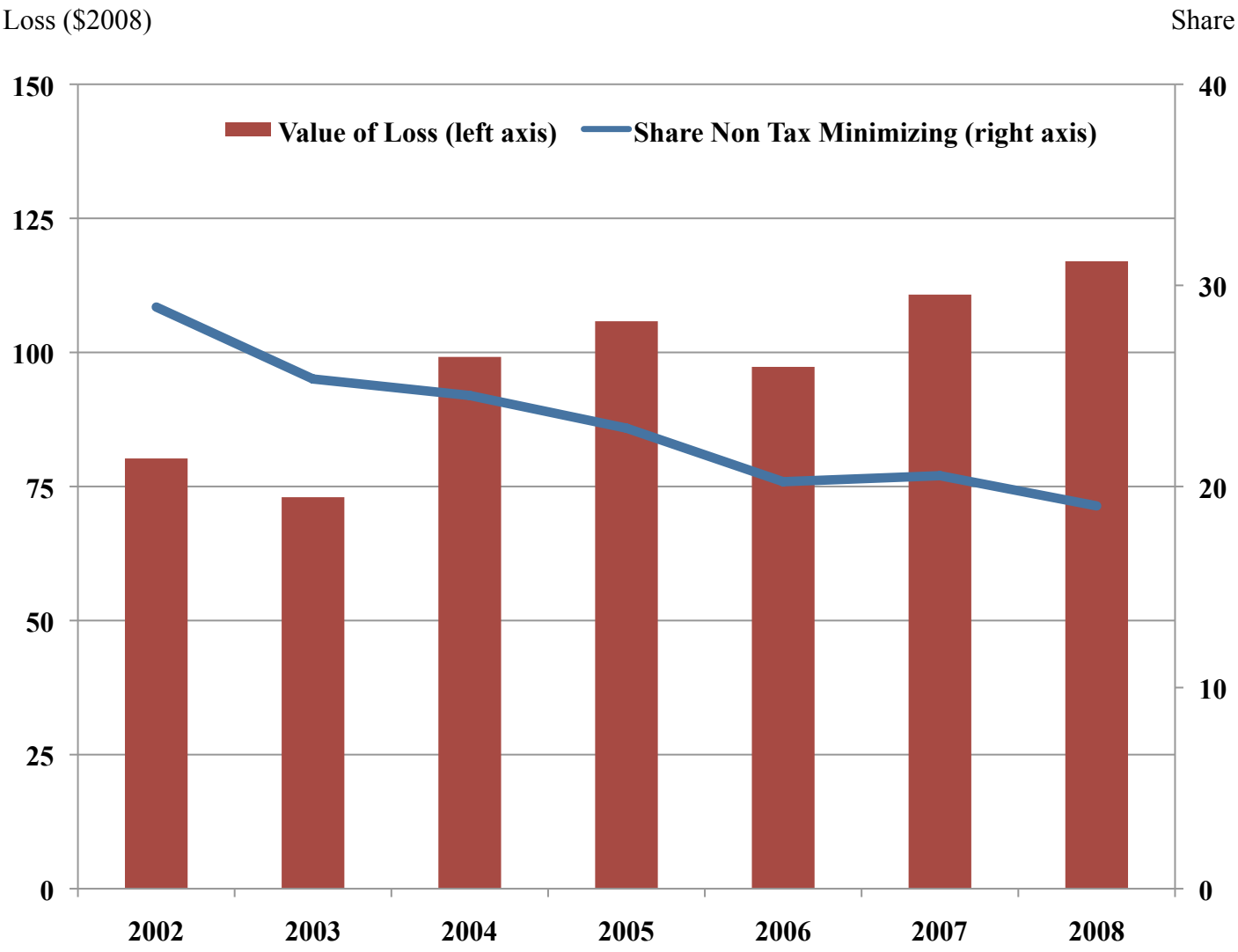

Figure 1
Share of Non Tax Minimizing Tax-Based Aid Claims and Dollar Value of the Average Loss from Non Tax Minimization, 2002-2008

Notes: By definition, a non tax-minimizing selection offers a smaller reduction in combined state and federal tax liability compared to the alternate program. The sample includes returns claiming either the Lifetime Learning Tax Credit or the Tuition Deduction. See Section 3.1 for details.

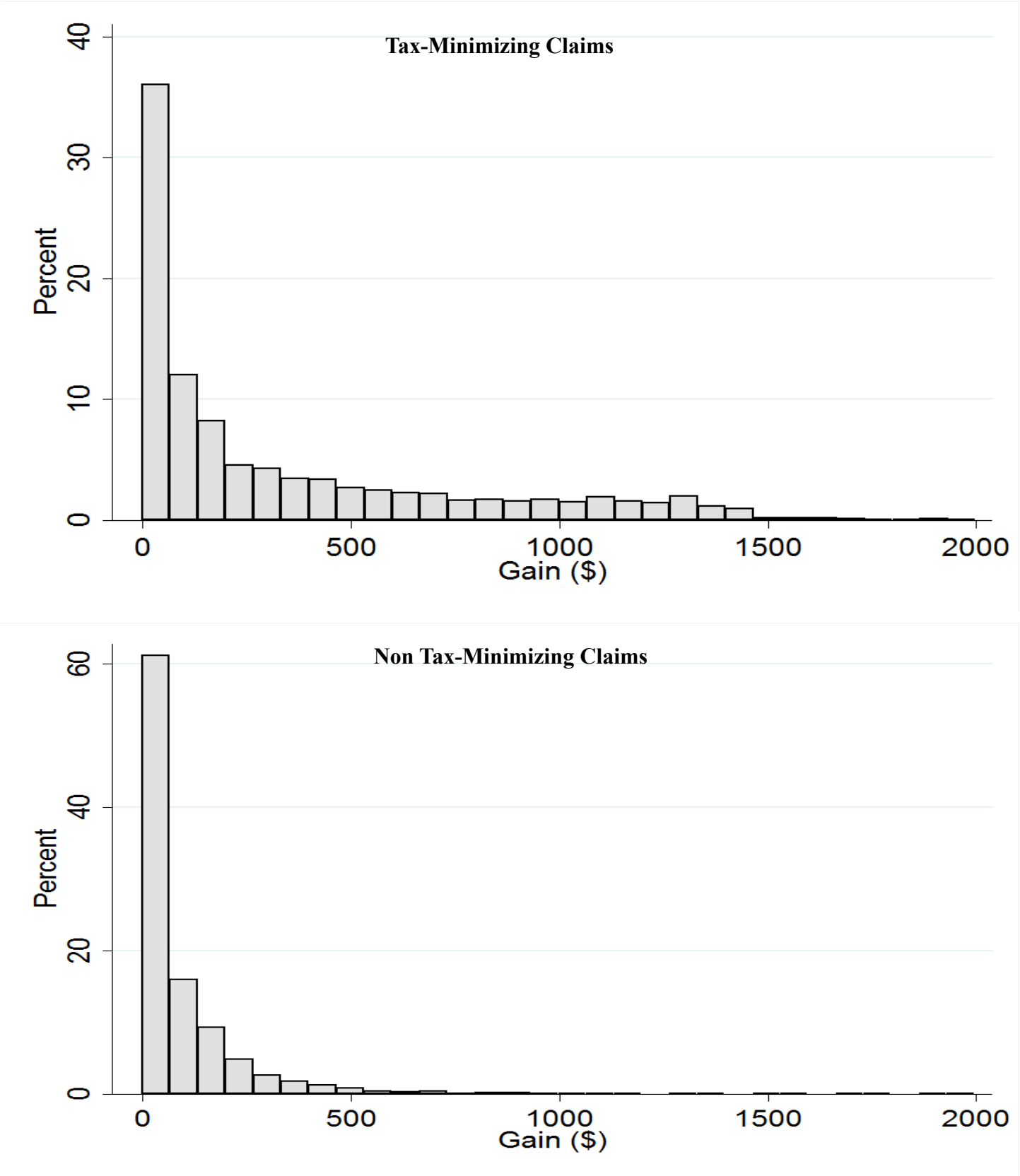

Figure 2
Distributions of Gains from Tax Minimization

Note: All dollar values are in 2008 dollars.

Table 1

Tax-Based Aid Program Details, 1998-2008

	Hope Tax Credit	Lifetime Learning Tax Credit	Tuition and Fees Deduction
Expenses Covered	Tuition and required fees at an educational instituion eligible for Department of Education student aid programs. Expenses covered do not include medical expenses, room and board, transportation, insurance, scholarships, Pell Grants or any other tax free funds used to pay education expenses.		
Adjusted Gross Income Eligibility	1998-2001: Full credits for single (joint) returns less than $40,000 ($80,000). Credits linearly phased out for single (joint) returns until $50,000 ($100,000). 2002: Upper limits changed to and $51,000 ($102,000) for single (joint) returns. 2003: Upper limit changed $103,000 for joint returns. 2004: Upper limits changed to and $52,000 ($105,000) for single (joint) returns. 2005: Upper limits changed to and $53,000 ($107,000) for single (joint) returns. 2006: Upper limits changed to and $55,000 ($110,000) for single (joint) returns. 2007: Upper limits changed to and $57,000 ($114,000) for single (joint) returns. 2008: Upper limits changed to and $58,000 ($116,000) for single (joint) returns. Credits 2002-2008 linearly phased out beginning $10,000 ($20,000) below the upper limit for single (joint) returns.		2002-2003: Single filiers with less than $65,000. Married couples must file a joint return and have income less than $130,000. 2004-2008: Eligibility extended to single returns with income above $65,000 and below $80,000, joint returns with income greater than $130,000 and less than $160,000 at half the rate (see below).
Amount	100 percent of first $1,000 plus 50 percent of the next $1,000 of qualified education spending. Max credit $1,500 per student.	1998-2002: 20 percent of first $5,000. Max credit $1,000 per return. 2003: 20 percent of first $10,000. Max credit $2,000 per return.	2002-2003: 100 percent offirst $3,000 of education spending per return. 2004-2008: 100 percent offirst $4,000 of education spending per return for returns meeting the 2002-2003 AGI limits. 100 percent of first $2,000 for higher income returns (see above).
Recipient Eligibility	Only available for two tax years for the first two years of postsecondary education. Must be enrolled at least half-time, pursuing a degree or credential and student can't have a felony drug conviction.	Undergraduate, graduate, vocational education and job skills programs. Available for an indefinite number of years. Lack of a felony drug conviction rule does not apply.	
Start Date	January 1, 1998	July 1, 1998	Janury 1, 2002

Source: IRS Publication 970 "Tax Benefits for Education" Various Years.

Table 2
Mean Values of Tax Returns

	(1) Entire Sample	(2) Tax-Minimizing	(3) Non Tax-Minimizing	(4) |t| statistic (2)=(3)
Tax-Based Aid Use				
Value of Program Claimed	639	739	301	36.77
Value of Alternate Program	372	364	400	3.74
Tax Return Characteristics				
Adjusted Gross Income	42,959	43,713	40,412	18.93
Federal Taxes Owed	3,006	3,045	2,874	9.05
Total Dependents	0.76	0.76	0.74	2.01
Joint Return	0.51	0.51	0.49	5.09
Amount of Refund	2,141	2,194	1,964	9.21
Tax Return Complexity				
Form 1040	0.67	0.67	0.66	8.07
Standard Deduction	0.58	0.58	0.60	8.63
Schedule B	0.12	0.12	0.11	7.00
Schedule C	0.18	0.19	0.18	1.87
Paid Tax Preparation	0.52	0.52	0.51	1.07
IRA Deduction	0.04	0.04	0.04	0.97
IRA Deduction Amount	107	103	118	0.15
Student Loan Deduction	0.24	0.24	0.24	1.22
Student Loan Deduction Amount	172	179	151	3.79
Tax-Based Aid Use in Previous Year				
Hope Tax Credit	0.10	0.11	0.10	4.73
Minimizing Tuition Deduction	0.10	0.10	0.07	9.05
Minimizing Lifetime Learning Tax Credit	0.21	0.24	0.12	9.89
Non-Minimizing Tuition Deduction	0.03	0.02	0.06	8.36
Non-Minimizing Lifetime Learning Tax Credit	0.06	0.04	0.11	14.39
No Tax-Based Aid Progam Claimed	0.50	0.49	0.55	5.50
Number of Returns	21,126	16,302	4,824	

Column (1) includes the entire sample. Only tax-minimizing [non tax-minimizing returns] are included in Column (1) [Column (2)]. Column (3) reports the |t|-statistic testing Column (2)=Column (3).
All dollar amounts are in 2008 dollars.
Data from the IRS Continuous Work History Sample, 2002-2008.

Table 3
Combined Gain and Tax Minimization

	(1)	(2)	(3)
Combined Gain	0.044	0.042	0.024
	[0.002]	[0.006]	[0.002]
Select Taxreturn Characteristics			
Paid Preparation	-0.003	-0.103	0.063
	[0.006]	[0.009]	[0.006]
Adjusted Gross Income	-0.000	-0.000	0.000
	[0.000]	[0.000]	[0.000]
Federal Taxes Owed	0.000	0.006	-0.005
	[0.000]	[0.000]	[0.000]
Standard Deduction	-0.023	-0.106	0.048
	[0.008]	[0.013]	[0.009]
1040	-0.008	0.015	-0.014
	[0.008]	[0.013]	[0.008]
Schedule B	-0.011	0.037	-0.023
	[0.009]	[0.015]	[0.010]
Schedule C	-0.009	0.006	-0.009
	[0.007]	[0.012]	[0.007]
Take IRA Deduction	-0.014	-0.024	-0.021
	[0.023]	[0.033]	[0.025]
Take Student Loan Deduction	-0.017	-0.054	-0.000
	[0.009]	[0.014]	[0.009]
Mean Dependent Variable	0.77	0.66	0.85
Mean Combined Gain	3.12	1.84	4.01
Number of Returns	21,126	8,666	12,460
Pseudo R^2			

Average marginal effects from a probit are reported. Standard errors are calculated by the delta method and are clustereed at the tax unit level. The Combined Gain variable is measured in $100s ($2008).
The sample in Column (1) includes all returns. The sample in Column (2) [Column (3)] includes all returns for which the Tuition Deduction [Lifetime Learning Tax Credit] is tax minimizing.
Control variables include indicator variables for the following: number of dependents, Census Division of residence, tax form, itemized deductions, gender of primary taxpayer and prior tax-based aid use.
I also control for adjusted gross income, wages and time. See Section 3.2 for details.

Table 4
Opportunity Costs and Tax Minimization

	(1)	(2)	(3)
	Panel A: High Opportunity Cost Self-Prepared Taxpayers		
Combined Gain	0.067	0.055	0.057
	[0.095]	[0.119]	[0.131]
Mean Dependent Variable	0.68	0.64	0.72
Mean Combined Gain	0.11	0.10	0.12
Number of Returns	2,877	1,544	1,333
Pseudo R^2			
	Panel B: Low Opportunity Cost Self-Prepared Taxpayers		
Combined Gain	0.042	0.039	0.024
	[0.003]	[0.005]	[0.003]
Mean Dependent Variable	0.81	0.77	0.83
Mean Combined Gain	3.99	2.71	4.76
Number of Returns	7,345	2,742	4,603
Pseudo R^2			

Average marginal effects from a probit are reported. Standard errors are calculated by the delta method and are clustereed at the tax unit level. The Combined Gain variable is measured in $100s ($2008).
The sample in Column (1) includes all returns. The sample in Column (2) includes all returns for which the Tuition Deduction is tax-minimizing. The sample in Column (3) includes all returns for which the Lifetime Learning Tax Credit is tax minimizing.
Panel A (B) includes high (low) opportunity cost returns. By definition high (low) opportunity cost returns have a gain per per hour from tax minimization that is less than (greater than) the wage rate. See text Section 4.2 for details.
Control variables include indicator variables for the following: number of dependents, Census Division of residence, tax form, itemized deductions, gender of primary taxpayer and prior tax-based aid use.
I also control for adjusted gross income, wages and time. See Section 3.2 for details.

Table 5
Salience Effects and Tax Minimization

	(1)	(2)	(3)
Panel A: Federal and State Tax Effects			
Federal Tax Effect	0.052	0.058	0.026
	[0.002]	[0.004]	[0.002]
State Tax Effect	-0.024	0.005	-0.004
	[0.002]	[0.006]	[0.002]
Pseudo R^2			
Panel B: Non-Tax-Minimizing Federal Salience Effect			
Federal Tax Effect	0.037	0.030	0.026
	[0.002]	[0.003]	[0.002]
State Tax Effect	-0.009	0.018	-0.004
	[0.002]	[0.008]	[0.002]
Non-Tax-Minimizing Federal Salience Effect	-0.218	-0.189	-0.036
	[0.010]	[0.012]	[0.025]
Pseudo R^2			
Mean Dependent Variable	0.77	0.66	0.85
Mean Federal Tax Effect	2.99	1.18	4.23
Mean State Tax Effect	0.13	0.66	-0.24
Number of Returns	21,126	8,666	12,460

Average marginal effects from a probit are reported. Federal and State Tax Effects are measured in $100s ($2008).
Standard errors are calculated by the delta method and are clustereed at the tax unit level.
The sample in Column (1) includes all returns. The sample in Column (2)
[Column (3)] includes all returns for which the Tuition Deduction [Lifetime Learning Tax Credit] is tax minimizing.
Panel B adds the *Non Tax-Minimizing Federal Salience Effect* variable to the specification reported in Panel A.
Control variables include indicator variables for the following: number of dependents, Census Division
of residence, tax form, itemized deductions, gender of primary taxpayer and prior tax-based aid use.
I also control for adjusted gross income, wages and time. See Section 3.2 for details.

Table 6

Inertia Effects for Continuing Users & Salience Effects for First-time Tax-Based Aid Users

	(1)	(2)	(3)
Panel A: Effects of Prior Tax-Based Aid Use			
Hope Tax Credit	-0.001	-0.076	0.052
	[0.009]	[0.015]	[0.011]
Tax-Minimizing Tuition Deduction	0.057	0.110	-0.026
	[0.010]	[0.015]	[0.012]
Tax-Minimizing Lifetime Learning Tax Credit	0.073	-0.072	0.109
	[0.008]	[0.013]	[0.008]
Non-Tax-Minimizing Tuition Deduction	-0.148	0.119	-0.153
	[0.014]	[0.032]	[0.012]
Non-Tax-Minimizing Lifetime Learning Tax C	-0.109	-0.214	0.083
	[0.010]	[0.015]	[0.018]
Mean Dependent Variable	0.77	0.66	0.85
Number of Returns	21,126	8,666	12,460
Pseudo R^2			
Panel B: Salience Effects for First Time Tax-Based Aid Users			
Federal Tax Effect	0.042	0.031	0.036
	[0.003]	[0.005]	[0.003]
State Tax Effect	-0.008	0.010	-0.008
	[0.004]	[0.009]	[0.004]
Non Tax-Minimizing Federal Salience Effect	-0.218	-0.192	-0.043
	[0.014]	[0.016]	[0.040]
Mean Dependent Variable	0.75	0.68	0.81
Mean Federal Tax Effect	2.42	1.08	3.50
Mean State Tax Effect	0.17	0.59	-0.17
Number of Returns	10,756	4,789	5,967
Pseudo R^2			

Average marginal effects from a probit are reported. Standard errors are calculated by the delta method and are clustereed at the tax unit level. The sample in Column (1) includes all returns. The sample in Column (2) [Column (3)] includes all returns for which the Tuition Deduction [Lifetime Learning Tax Credit] is tax minimizing. Panel B limits the sample to first time tax-based aid users and does not include controls for prior use. Control variables include indicator variables for the following: number of dependents, Census Division of residence, tax form, itemized deductions, gender of primary taxpayer and prior tax-based aid use. I also control for adjusted gross income, wages and time. See Section 3.2 for details.

Table A1
Robustness Tests, Flexible Income Controls (Cubic Spline)

	(1)	(2)	(3)
Tax Salience Effects			
Federal Tax Effect	0.053	0.058	0.026
	[0.002]	[0.003]	[0.002]
State Tax Effect	-0.024	0.005	-0.004
	[0.002]	[0.006]	[0.002]
Inertia Effects			
Hope Tax Credit	-0.005	-0.076	0.052
	[0.009]	[0.014]	[0.011]
Minimizing Tuition Deduction	0.052	0.105	-0.026
	[0.010]	[0.014]	[0.012]
Minimizing Lifetime Learning Tax Credit	0.082	-0.069	0.108
	[0.008]	[0.013]	[0.008]
Non-Minimizing Tuition Deduction	-0.142	0.122	-0.154
	[0.014]	[0.031]	[0.012]
Non-Minimizing Lifetime Learning Tax Credit	-0.131	-0.210	0.084
	[0.010]	[0.014]	[0.018]
Mean Dependent Variable	0.77	0.66	0.85
Mean Federal Tax Effect	2.99	1.18	4.23
Mean State Tax Effect	0.13	0.66	-0.24
Number of Returns	21,126	8,666	12,460

Income controls include a cubic spline function of income with 3 knots.
Average marginal effects from a probit are reported. Standard errors are calculated by the delta method and are clustereed at the tax unit level. The sample in Column (1) includes all returns. The sample in Column (2) [Column (3)] includes all returns for which the Tuition Deduction [Lifetime Learning Tax Credit] is tax minimizing. Control variables include indicator variables for the following: number of dependents, Census Division of residence, tax form, itemized deductions, gender of primary taxpayer and prior tax-based aid use. I also control for adjusted gross income, wages and time. See Section 3.2 for details.

Table A2
Robustness Tests, Low Opportunity Cost Self-Prepared Returns

	(1)	(2)	(3)
Tax Salience Effects			
Federal Tax Effect	0.044	0.045	0.027
	[0.003]	[0.006]	[0.003]
State Tax Effect	-0.002	0.019	-0.008
	[0.004]	[0.010]	[0.003]
Inertia Effects			
Hope Tax Credit	0.014	-0.050	0.042
	[0.016]	[0.025]	[0.019]
Minimizing Tuition Deduction	0.032	0.074	-0.032
	[0.015]	[0.021]	[0.019]
Minimizing Lifetime Learning Tax Credit	0.068	-0.073	0.101
	[0.012]	[0.020]	[0.013]
Non-Minimizing Tuition Deduction	-0.166	0.104	-0.171
	[0.019]	[0.046]	[0.017]
Non-Minimizing Lifetime Learning Tax Credit	-0.081	-0.169	0.089
	[0.019]	[0.024]	[0.037]
Mean Dependent Variable	0.81	0.77	0.83
Mean Federal Tax Effect	3.81	1.90	4.95
Mean State Tax Effect	0.18	0.81	-0.19
Number of Returns	7,345	2,742	4,603

The sample is limited to low opportunity cost returns. By definition low opportunity cost taxpayers have a gain per unit time from minimization that exceeds their wage. See text 4.2 for details.
Average marginal effects from a probit are reported. Standard errors are calculated by the delta method and are clustereed at the tax unit level. The sample in Column (1) includes all returns. The sample in Column (2) [Column (3)] includes all returns for which the Tuition Deduction [Lifetime Learning Tax Credit] is tax minimizing.
Control variables include indicator variables for the following: number of dependents, Census Division of residence, tax form, itemized deductions, gender of primary taxpayer and prior tax-based aid use.
I also control for adjusted gross income, wages and time. See Section 3.2 for details.

Table A3
Robustness Tests, Sample Years 2002-2005

	(1)	(2)	(3)
Tax Salience Effects			
Federal Tax Effect	0.060	0.060	0.035
	[0.004]	[0.005]	[0.003]
State Tax Effect	-0.025	0.003	-0.004
	[0.003]	[0.007]	[0.004]
Inertia Effects			
Hope Tax Credit	0.005	-0.109	0.093
	[0.014]	[0.021]	[0.017]
Minimizing Tuition Deduction	0.089	0.125	0.001
	[0.016]	[0.021]	[0.020]
Minimizing Lifetime Learning Tax Credit	0.103	-0.078	0.151
	[0.013]	[0.021]	[0.013]
Non-Minimizing Tuition Deduction	-0.181	0.178	-0.178
	[0.020]	[0.045]	[0.017]
Non-Minimizing Lifetime Learning Tax Credit	-0.124	-0.251	0.112
	[0.016]	[0.023]	[0.029]
Mean Dependent Variable	0.75	0.66	0.81
Mean Federal Tax Effect	2.48	1.00	3.55
Mean State Tax Effect	0.15	0.59	-0.17
Number of Returns	11,500	4,822	6,678

The Sample limits the analysis period to 2002-2005.
Average marginal effects from a probit are reported. Standard errors are calculated by the delta method and are clustereed at the tax unit level. The sample in Column (1) includes all returns. The sample in Column (2) [Column (3)] includes all returns for which the Tuition Deduction [Lifetime Learning Tax Credit] is tax minimizing. Control variables include indicator variables for the following: number of dependents, Census Division of residence, tax form, itemized deductions, gender of primary taxpayer and prior tax-based aid use. I also control for adjusted gross income, wages and time. See Section 3.2 for details.

Table A4

Robustness Tests, Returns that do not change Tax Filing Status, 2002-2008

	(1)	(2)	(3)
Tax Salience Effects			
Federal Tax Effect	0.052	0.058	0.026
	[0.002]	[0.004]	[0.002]
State Tax Effect	-0.023	0.005	-0.004
	[0.002]	[0.006]	[0.002]
Inertia Effects			
Hope Tax Credit	-0.003	-0.086	0.060
	[0.010]	[0.015]	[0.011]
Minimizing Tuition Deduction	0.064	0.128	-0.029
	[0.011]	[0.016]	[0.013]
Minimizing Lifetime Learning Tax Credit	0.089	-0.090	0.121
	[0.008]	[0.015]	[0.009]
Non-Minimizing Tuition Deduction	-0.158	0.129	-0.160
	[0.015]	[0.036]	[0.012]
Non-Minimizing Lifetime Learning Tax Credit	-0.146	-0.247	0.105
	[0.011]	[0.016]	[0.021]
Mean Dependent Variable	0.77	0.66	0.85
Mean Federal Tax Effect	3.00	1.19	4.26
Mean State Tax Effect	0.13	0.66	-0.24
Number of Returns	20,321	8,311	12,010
Number of Tax Units			

The Sample limits includes only returns that do not alter their tax filing status during the analysis period.
Average marginal effects from a probit are reported. Standard errors are calculated by the delta method
and are clustereed at the tax unit level. The sample in Column (1) includes all returns. The sample in Column (2)
[Column (3)] includes all returns for which the Tuition Deduction [Lifetime Learning Tax Credit] is tax minimizing.
Control variables include indicator variables for the following: number of dependents, Census Division
of residence, tax form, itemized deductions, gender of primary taxpayer and prior tax-based aid use.
I also control for adjusted gross income, wages and time. See Section 3.2 for details.