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## **Are Higher 529 College Savings Plan Fees Linked to Greater State Tax Incentives?**

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# Are Higher 529 College Savings Plan Fees Linked to Greater State Tax Incentives?

Vicki Bogan\*

This Version: April 2008

## Abstract

Despite the fact that 529 College Savings Plans have existed for over a decade, there has been limited scholarly attention on investment questions related to this savings vehicle. In some of the first academic literature on this topic, Alexander and Luna (Supplement 2005) identified a surprising relationship between 529 College Savings Plan participation and plan fees. They found a positive relationship between participation rates and fees. While they link this counter-intuitive result to plan marketing efforts by brokers, I propose an alternative view. In my data which covers a five year time span, I find no significant relationship between participation rates and fees. However, when investigating the tax incidence with respect to 529 plans, I find a positive relationship between state tax rates and 529 plan fees. This suggests that investment companies could be opportunistically setting fees to usurp the benefits which state governments intended for investors. Since state tax incentives are designed to induce participation and plan fees (by design) are correlated with these incentives, the positive link between plan fees and participation becomes less of a puzzle. (JEL: G10, G11, H24, I22)

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# 1 Introduction

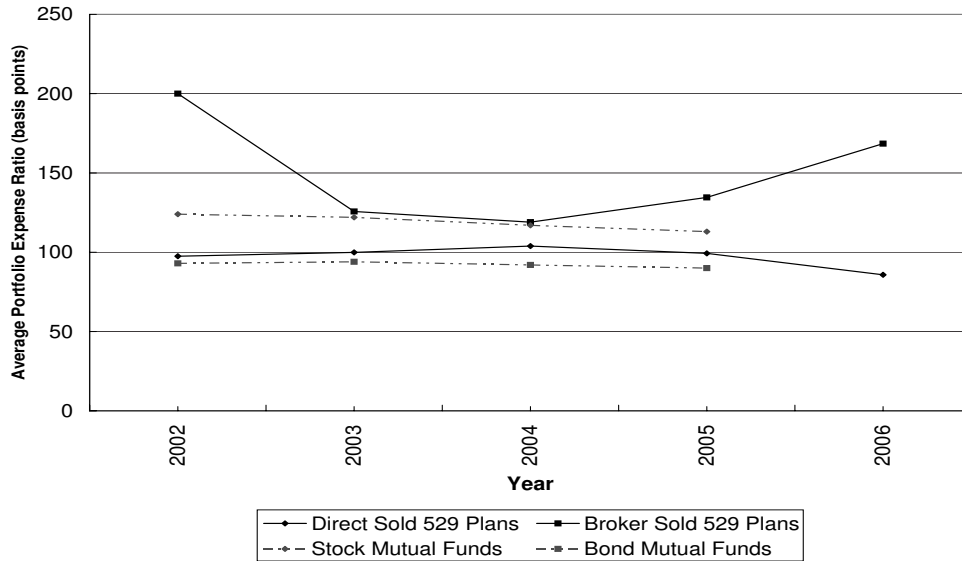
529 College Savings Plans have been in existence for over a decade with their popularity as investment vehicles growing each year. Exponentially rising college education costs have further accelerated the rate of interest in these investment vehicles such that now almost every state has multiple 529 plan options. The increasing interest in these plans as investment options has spawned a corresponding interest in the costs associated with these plans. Expenses charged by fund companies for running 529 programs vary dramatically across the states. Costs range from 0.25% to 3.45% of assets charged annually (Hurley, 2006). While the costs do differ depending on whether the 529 plan is a broker sold or allows direct enrollment, even direct enroll plans exhibit considerable variation in fees across states. Variation in fees on mutual funds is well-documented (e.g., Khorana, Servaes, and Tufano (2007); Dellva and Olson (1998)), so some of this variation appears to be consistent with mature equity markets. Yet, fees charged on broker sold 529 plan accounts have been well above those charged by the underlying mutual funds themselves (See Figure 1).

529 plans *should* have lower costs, since investors are constrained from changing their asset allocations ever, and can change the allocation of contributions only once per year. However, many 529 plans vary in their structure across the states and keeping up with the reporting requirements of each state's program might impose some extra costs for 529 plans (though these costs should certainly diminish over time). While it is plausible that the average costs of 529s should be different than that of mutual funds, it is not immediately obvious why there exists such variability of costs across the states. Why can Utah run a 529 plan whose annual costs represent 0.39% of assets while North Carolina's plan costs 1.32% of assets annually? One likely explanation is that the 529 plan market is an immature one and that competitive pressures will eventually eliminate these differentials. This is beginning to occur and funds such as OppenheimerFunds, Inc. have taken the lead on cutting fees.<sup>1</sup> Along those lines, the changes in the tax rules of 2001, which allow for annual rollover from one state's plan to another state's, the ability of consumers to shift toward

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<sup>1</sup>Paikert, C. "States vie to slash college savings plan fees: OppenheimerFunds takes lead in price wars." *Investment News*. January 8, 2007, p. 2.

Figure 1: Average Portfolio Expense Ratio in Basis Points, 2002 - 2006



Source: Collins (2006); Hurley (2006)

the lowest-cost alternative also serve to increase competition and market efficiency. Moreover, as information about the programs and their costs disseminates through the media, word of mouth, financial planners, and tax professionals, prices will further converge.

529 plans, especially those with deductibility of contributions from state income, are potentially of great benefit to consumers. However if most of this benefit is captured by the fund companies, prior to the convergence in the means and variances in plan costs, people in some states are no better off than they would have been in a retirement vehicle, housing equity, or non-tax-advantaged account. In light of the fact that numerous investment management companies manage 529 plans for multiple states, the considerable heterogeneity with respect to 529 plan fees across states is particularly striking. Within the raw data, one can identify a number of instances in which a single investment management company sets a significantly higher fees for one state over another. For example, in 2006, TIAA-CREF managed direct sold 529 plans in both Michigan and Idaho. The average fee for the direct sold 529 plan in Michigan was 60 bps while the average fee for the direct sold 529 plan in Idaho was 30 bps higher at 92 bps. Correspondingly, the fixed population average

state tax rate on wage income in Michigan was 3.87% while the fixed population average state tax rate on wage income in Idaho was 7.39%.

Across the United States, the 529 plans vary both in the timing of their introduction and the generosity of their incentives. For example, some states allow contributions to be deducted from taxable state income, while others do not. As a result, the explosion in availability of tax-advantaged savings vehicles provides a rich opportunity to develop further insight into the behavior of individual investors and financial institutions. Of the limited academic attention that has been devoted to 529 College Savings Plans, most of the literature explores the effects of pre-specified asset allocations on participation (e.g., See DeGennaro (2004); Spitzer and Singh (2001)). Alexander and Luna (Supplement 2005) investigate questions relating to fees and identify a positive relationship between plan participation rates and plan fees. While they link this result to plan marketing efforts by brokers, I propose an alternative view. In my plan-level data set which covers a five year time span, I address an open question in the literature by analyzing the relationship between 529 plan fees, tax benefits, and participation.

The remainder of the paper proceeds as follows. Section 2 reviews how taxes and fees affect participation decisions. Section 3 describes the data. Section 4 presents the econometric analysis and discusses the main results. Section 5 summarizes key findings and provides concluding remarks.

## **2 529 College Savings Plans**

### **2.1 529 Plans and Taxes**

The tax implications of 529 plans could have a strong impact on household saving and investment decisions. The 529 plans are part of an array of savings vehicles available to families. Before analyzing the marginal incentive effect of the 529 plan, we should first understand generally how savings are taxed outside of a 529 plan. Consider savings placed in a typical, non-tax-advantaged mutual fund account. The savings will be taxed at three points:

1. *Earned income is taxed before it is put into savings*

A dollar of pretax income destined for savings is first taxed at the federal and state level (at rates  $\tau_f$  and  $\tau_s$ , respectively), so that  $1 - \tau_f - \tau_s$  remains to be put into savings.

2. *Some earnings are taxed as they accrue*

Interest and dividends are taxed as they are earned. The federal tax code treats interest and dividends as ordinary, taxable income; most states do the same, though some have a special tax rate for this source of income. Capital gains are taxed as they are realized, which for savings in a mutual fund may occur before funds are withdrawn. When fund managers sell stock at a profit, they generate earnings for those who hold shares in the fund, who must then pay capital gains taxes. The states generally treat capital gains as ordinary income, while the federal government currently taxes them at a lower rate than ordinary income.<sup>2</sup> Returns are reduced by these taxes, from a pretax rate of  $r$  to a post-tax rate of  $r(1 - \tau_f - \tau_s)$ .

3. *Any yet untaxed earnings are taxed at withdrawal*

For an ordinary savings account or money market fund, there are no additional taxes at this point, since the earnings (interest and dividends) were taxed as they accrued. If a saver instead holds a stock that has grown in value, however, he will pay state and federal capital gains taxes on the profit when he sells the stock (that is, when the gains are realized). Capital gains taxes also kick in when funds are withdrawn from a mutual fund if stocks in the fund have unrealized gains in value.

529 plans eliminate taxes on asset returns; that is, the second and third forms of taxation. In 18 states, such as Illinois, even the first form of taxation is reduced, since contributions by residents to that state's 529 are excluded from state taxable income. Once any initial federal and state taxes are paid, there are no further taxes if the funds are used for post-secondary schooling expenses. In this way, a 529 plan is identical to a Roth IRA, in which after-tax dollars grow without taxation

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<sup>2</sup>For funds that follow a buy-and-hold strategy, which include funds that track an index like the S&P 500, capital gains are a minimal portion of earnings. These are referred to as tax-efficient funds. To keep notation simple, we ignore (for this section) the special federal tax rate on capital gains.

**Table 1: Comparison of Net Returns on Different Savings Vehicles**

<i>Nominal Value at Time T of a Dollar of Pre-Tax Income Invested in Different Vehicles</i>	
Type of Account	After-Tax Return
Non-tax-advantaged account (held in the name of parent)	$(1 - \tau_j^f - \tau_j^s - \tau_j^a)[1 + (1 - \tau_j^f - \tau_j^s - f_n^s)r]^T$
529 Plan in state that does <i>not</i> exclude contributions from taxable income	$(1 - \tau_j^f - \tau_j^s - \tau_j^a)[1 + r(1 - f_n^s)]^T$
529 Plan in state that excludes contributions from taxable income	$(1 - \tau_j^f - \tau_j^a)[1 + r(1 - f_n^s)]^T$

where  $r$  = annual gross return to assets

$f_n^s$  = annual asset-based fees for savings vehicle  $n$  in state  $s$

$\tau_j^f$  = marginal federal income tax rate of income group  $j$

$\tau_c^f$  = marginal federal income tax rate of child (lowest bracket)

$\tau_j^s$  = marginal state income tax rate of income group  $j$

$\tau_c^s$  = marginal state income tax rate of child in state  $s$  (lowest bracket)

$\tau_j^a$  = marginal aid tax rate of income group  $j$

$\tau_{j,c}^a$  = marginal aid income tax rate of child in income group  $j$

until the saver's retirement, when they can be withdrawn tax-free. A comparison of the net returns from different savings vehicles is summarized in Table 1.



## **2.2 529 Plans and Fees**

Like taxes, fees associated with 529 plans also vary considerably across the states. Fees reduce net returns on assets in the same way as a tax. Fees in 529 plans take two forms: lump-sum fees, such as enrollment fees and annual maintenance fees, and asset-based fees, which are calculated as a percentage of the account balance. This analysis will focus on asset-based fees. The lump-sum fees are relatively minor, ranging from \$0 to around \$100, and they are generally waived when deposits are automated or balances exceed a fairly low level, typically \$25,000. For an account of this size, asset-based fees are far more significant. Asset-based fees consist of a special 529 administrative fee charged by some states and the expense ratios charged by the individual mutual funds that underlie the age-based or static portfolios. The administrative fees vary from zero to 128 basis points. The expense ratios on the underlying funds vary substantially, from nearly zero for some passively managed funds to 345 basis points for one actively managed emerging-markets fund. Investors should be interested in investing in their home state 529 plan only when the higher 529 plan expense ratio is worth the additional tax break.

## **3 Data**

### **3.1 Description**

For the analysis I utilize 529 plan level data from 2002 through 2006. The data are compiled from various sources. The fee and plan characteristic data were collected from “The Best Way to Save for College: a Complete Guide to 529 Plans” by Joseph Hurley. The data on total number of contracts for each plan were compiled from the College Savings Plans Network. The U.S. household and population data were collected from the U.S. Census information. State tax rate information was collected from the National Bureau of Economic Research (NBER).

## 3.2 Summary Statistics

The panel data set, which covers a five year time period, contains 237 observations of direct sold 529 plans and 75 observations of broker sold 529 plans. Tables 2 and 3 present the summary statistics of the panel data. Figure 2 presents the 2002 - 2006 average state tax rates on interest, dividend and wage income which from Section 2.1 we know are the relevant tax rates for calculating the value of investing in a 529 plan.<sup>3</sup>

Table 4 shows the average portfolio expense ratio means and standard deviations in basis points (bps). From this table we see that the average fees for direct sold 529 plans peaked in 2004 and subsequently began to decline. Yet, the broker sold plans generally had increasing fees. The variance in fees for direct sold or broker sold plans do not seem to have a discernable pattern. We see from the raw statistics in Table 4 that there are large difference in the fees between direct sold and broker sold plans. An analysis of variance (ANOVA) indicates that the differences in the means are statistically significant (See Table 5). Table 6 shows the correlation between plan fees and various types of state tax rates. We can see from Table 6 that the fee are positively correlated will all of the relevant state tax rates.

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<sup>3</sup>The NBER calculates the tax rates as follows: Allow the state marginal tax rates to vary across states and years only due to state tax rates. The nationwide population of households in 1995 is run through each state's tax code in each year. This generates the average marginal tax rates, by state and year, that would exist if only tax rates varied across time and state, but households were held constant.

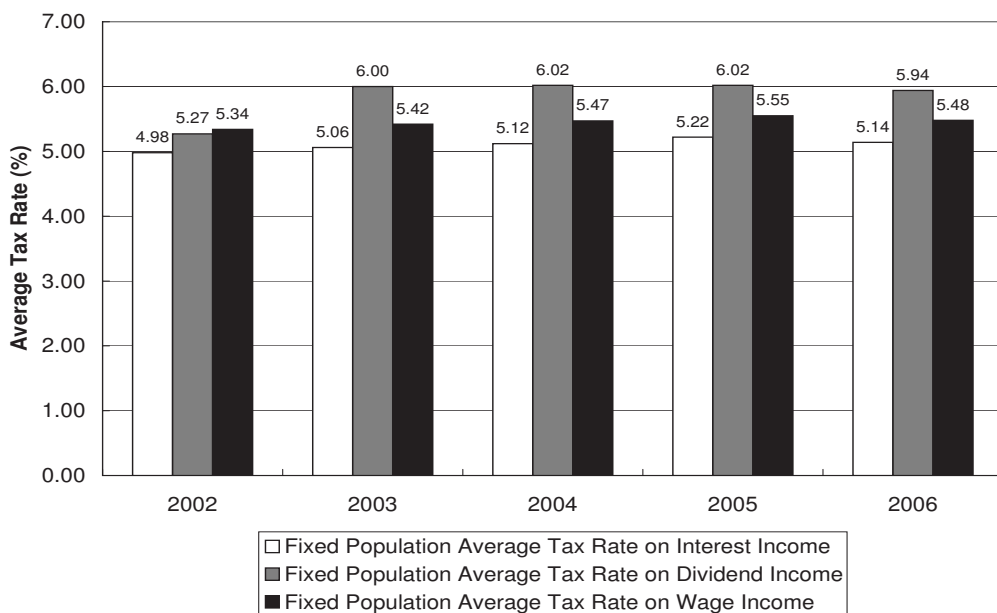
**Table 2: Summary Statistics – Direct Sold and Broker Sold Plan Characteristics**

	Direct Sold			Broker Sold		
	Mean	Minimum	Maximum	Mean	Minimum	Maximum
Average Portfolio Expense Ratio (bps)	97.0	14.0	21.0	141.4	25.0	245.5
Minimum Portfolio Expense Ratio (bps)	81.1	0.0	18.0	93.3	0.0	231.0
Maximum Portfolio Expense Ratio (bps)	112.9	28.0	275.0	189.4	25.0	345.0
Average Enrollment Fee (\$)	6.4	0.0	90.0	2.1	0.0	20.0
Average Maintenance Fee (\$)	13.5	0.0	50.0	24.9	0.0	50.0
% of Plans with State Deduction Available	69.5	–	–	73.0	–	–
Average Max Value of Deduction	3,545	250	12,000	3,153	250	10,000
Average Number of Contracts per Plan	73,940	1,354	885,361	575,915	491,240	673,910
States (plus DC) Represented	50	–	–	22	–	–
Observations	237			75		

**Table 3: Plans With and Without State Tax Deductions**

	States With Tax Deductions			States Without Tax Deductions		
	Mean	Minimum	Maximum	Mean	Minimum	Maximum
Average Portfolio Expense Ratio (bps)	101.9	14.0	224.0	114.9	52.5	245.5
Minimum Portfolio Expense Ratio (bps)	80.3	0.0	144.0	89.7	32.0	231.0
Maximum Portfolio Expense Ratio (bps)	123.6	25.0	345.0	140.0	60.0	297.0
Average Enrollment Fee (\$)	19.3	0.0	90.0	26.6	0.0	100.0
Average Maintenance Fee (\$)	13.8	0.0	50.0	25.6	0.0	100.0
Average Number of Contracts per Plan	86,037	56	885,361	147,816	1,354	1,173,113
States (plus DC) Represented		–	–		–	–
Observations	226			97		

**Figure 2: Average State Tax Rates on Interest, Dividend, and Wage Income, 2002 - 2006**



*Source: National Bureau of Economic Research*

**Table 4: Average Portfolio Expense Ratio (bps) Means and Std. Deviations**

	2002	2003	2004	2005	2006
Direct Sold 529 Plans					
Mean	97.5	99.9	103.9	99.3	85.8
Std. Deviation	37.5	35.5	29.7	34.5	28.0
Observations	30	40	55	55	57
Broker Sold 529 Plans					
Mean	200.0	125.7	119.0	134.6	168.5
Std. Deviation	.	35.5	40.6	52.5	39.8
Observations	1	9	17	24	24
Total 529 Plans					
Mean	100.8	104.7	107.4	110.1	109.6
Std. Deviation	41.2	36.5	32.9	43.6	49.2
Observations	31	49	72	79	81

**Table 5: Analysis of Variance - Average Portfolio Expense Ratios for Direct Sold and Broker Sold 529 Plans**

	SS	df	F	Prob > F	R-squared
2002	10167.34	1	7.22	0.0118	0.1993
2003	4884.63	1	3.88	0.0548	0.0762
2004	2962.80	1	2.81	0.0983	0.0386
2005	20777.42	1	12.52	0.0007	0.1399
2006	112243.40	1	111.16	0.0000	0.5877

**Table 6: Correlation Between Plan Fees and Various State Tax Rates**

	Average Fee	Minimum Fee	Maximum Fee
Wage Income State Tax Rate	0.0876	0.0458	0.0923
Interest Income State Tax Rate	0.1252	0.1036	0.1145
Dividend Income State Tax Rate	0.0593	0.1058	0.0285

## 4 Econometric Analysis and Results

### 4.1 Participation and Plan Characteristics

As in Alexander and Luna (Supplement 2005), I begin by investigating the relationship between total number of plan contracts and plan characteristics. I look at the link between total number of contracts for each plan and various plan characteristics. The specification of Equation 1 uses total number of plan contracts as the dependent variable. The independent variables include: average plan fees, a dummy variable if the plan is in a state with a state tax deduction, a variable indicating the potential wage income benefit of the tax deduction (wage income tax rate\*maximum value of state tax deduction), a variable indicating the potential interest income benefit of the tax deduction (interest income tax rate\*state tax deduction dummy variable), a dummy variable indicating if the plan is broker sold, a plan age variable, year dummy variables, the log of the number of households in the state, the log of the state population under age 18. (A description of all of the variables used can be found in Appendix A.)

$$TOTALCONTRACTS_i = \beta_0 + \sum_{i=1}^{12} \beta_i X + \epsilon \quad (1)$$

The results of Equation 1 are presented in Table 7.<sup>4</sup> From Table 7 we see that there is no significant link between total number of plan contracts and average portfolio fees. However, the broker dummy variable is positive and significant at the 1% level, initially supporting the assertion that participation is positively affected by the marketing efforts of brokers. The year 2006 dummy variable is positive and significant at the 10% level. The log of the number of state households variable is positive and significant at the 12% level. None of the other variables are significant.

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<sup>4</sup>Standard errors are adjusted to account for the fact that there are multiple observations for each plan.

**Table 7: Plan Participation Regression**

	Coefficient	Standard Error	t-ratio
<b>Dependent Variable:</b> Total Number of Contracts (bps)			
Average Portfolio Expense Ratio	271.39	433.04	0.63
State Tax Deduction Dummy	45,476.10	110,402.30	0.41
Potential Benefit for Wage Income	-78.90	96.87	-0.81
Potential Benefit for Interest Income	-2,384.65	17,817.34	-0.13
Broker Sold Plan Dummy	388,844.50	55,180.24	7.05
Plan Age	4,985.16	5,831.22	0.85
Year 2003 Dummy	-3,759.49	37,604.87	-0.10
Year 2004 Dummy	21,731.87	53,072.18	0.41
Year 2005 Dummy	-7,394.47	30,389.52	-0.24
Year 2006 Dummy	-41,710.12	23,448.75	-1.78
Log of Number of State Households	156,277.70	97,959.97	1.60
Log of State Population Under Age 18	-102,697.90	104,210.50	-0.99
Intercept	-387,135.10	154,097.20	-2.51
Observations	83	R-squared	0.4608

## 4.2 Average Fees and Plan Characteristics

Given the correlations we observe in Table 6, I next look at the link between average portfolio fees and various plan characteristics. The specification of Equation 2 uses average portfolio fees as the dependent variable. The independent variables include: a dummy variable if the plan is in a state with a state tax deduction, a variable indicating the potential wage income benefit of the tax deduction (wage income tax rate\*maximum value of state tax deduction), a variable indicating the potential interest income benefit of the tax deduction (interest income tax rate\*state tax deduction dummy variable), a dummy variable indicating if the plan is broker sold, a plan age variable, year dummy variables, the log of the number of households in the state, the log of the state population under age 18, and the number of competing plans in the state.

$$AVGFEEES_i = \beta_0 + \sum_{i=1}^{12} \beta_i X + \epsilon \quad (2)$$

The results of Equation 2 are presented in Table 8. From Table 8, not surprisingly we see that the broker sold dummy variable is positively related to average fees and significant at the 1% level. The number of competing 529 plans in the state variable is positive and significant at the 5% level, indicating that this is not yet a fully mature market in which competition drives down prices. The log of the number of households in the state is positive and significant at the 5% level. The log of the state population under 18 and the year 2005 dummy have negative coefficients with significance at the 1% level. The year 2004 dummy variable is negative and significant at the 10% level.<sup>5</sup> None of the other variables are significant.

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<sup>5</sup>Standard errors are adjusted to account for the fact that there are multiple observations for each investment management company. Results are robust to standard error adjustments made for multiple observations for plans or states.



**Table 8: Portfolio Fees Regression**

	Coefficient	Standard Error	t-ratio
<b>Dependent Variable:</b> Average Portfolio Expense Ratio (bps)			
State Tax Deduction Dummy	-2.00	27.70	-0.07
Potential Benefit for Wage Income	0.01	0.01	0.67
Potential Benefit for Interest Income	-0.50	4.70	-0.11
Broker Sold Plan Dummy	30.64	11.41	2.69
Plan Age	-1.40	1.29	-1.08
Year 2003 Dummy	-6.92	7.85	-0.88
Year 2004 Dummy	-16.33	8.27	-1.98
Year 2005 Dummy	-27.30	10.65	-2.56
Year 2006 Dummy	-11.93	9.73	-1.23
Log of Number of State Households	62.60	25.51	2.45
Log of State Population Under Age 18	-68.96	24.76	-2.79
Number of Competing 529 Plans in State	6.79	2.95	2.30
Intercept	123.40	30.12	4.10
Observations	167	R-squared	0.3790

### 4.3 Direct Sold Subsamples

Since the broker sold and direct sold plans have significantly different enrollment procedures and average fee structures (see Table 5), I look at Equation 2 using the subsample of direct sold plans.<sup>6</sup> Table 9 contains the results for the direct sold subsample.<sup>7</sup> In Table 9, Version A of Equation 2 shows that the state tax deduction dummy is negative and significant at the 15% level. Accordingly, we initially may infer that fees generally are lower for plans that are in states with a tax deduction. However, from Version B of Equation 2, we see that fees are positively related to the potential benefit for wage income variable and the potential benefit for interest income variable. In Version C of Equation 2, which includes state dummy variables, the potential benefit for wage income is positive and significant at the 7% level.<sup>8</sup>

### 4.4 Fixed Effects

Several investment management companies manage 529 plans for more than one state. Given this aspect of the data, I use a fixed effects model to control for investment management company fixed effects since some investment management companies could generally charge higher fees due to overhead costs or providing “premium” expertise. Table 10 presents the results of the direct sold plans fixed effects regression. This table provides more compelling evidence in support of our assertion that investment management companies set higher fees for plans in states with larger tax benefits for residents. For example, again we find that the potential benefit for wage income is positive and significant at the 9% level. From the coefficient of the potential benefit for wage income variable, we see that a \$100 increase in potential wage benefit is associated with a 3 basis point increase in fees for direct sold plans.

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<sup>6</sup>Due to the additional services provided with broker sold plans the fees are generally higher and have greater variability.

<sup>7</sup>Standard errors are adjusted to account for the fact that there are multiple observations for each investment management company. Results are robust to standard error adjustments made for multiple observations for plans or states.

<sup>8</sup>I also tested Equation 1 using the broker sold subsample. The signs of the coefficients for Equation 2, using the broker sold subsample, were consistent with those in Table 9. However, given the small sample size of the broker sold subsample, the coefficients were not highly significant.

**Table 9: Direct Sold Plan Fees Regressions**

	(A)	(B)	(C)
<b>Dependent Variable:</b> Average Portfolio Expense Ratio (bps)			
State Tax Deduction Dummy	-11.96 <sup>†</sup> (7.96)	-12.67 (20.84)	
Potential Benefit for Wage Income		0.00 (0.01)	0.04* (0.02)
Potential Benefit for Interest Income		0.90 (3.29)	-1.76 (11.05)
Plan Age	-2.65* (1.53)	-2.36* (1.24)	-0.61 (1.97)
Year 2003 Dummy	-4.56 (4.30)	-4.82 (5.27)	-8.01 <sup>†</sup> (5.72)
Year 2004 Dummy	-2.97 (6.50)	-7.42 (7.43)	-5.78 (8.51)
Year 2005 Dummy	-12.65 <sup>†</sup> (8.17)	-19.88* (10.18)	-14.00 <sup>†</sup> (9.26)
Year 2006 Dummy	-20.64** (8.61)	-20.87* (11.23)	-21.44** (9.80)
Log of Number of State Households	59.84** (26.60)	68.24*** (25.67)	
Log of State Population Under Age 18	-68.07*** (26.65)	-73.49*** (23.45)	
Number of Competing 529 Plans in State	-2.36 (2.91)	4.56 (2.94)	
State Dummy Variables			....
Intercept	165.21 (28.29)	127.37 (28.50)	139.37 (12.43)
Observations:	169	123	123
R-squared:	0.2527	0.3033	0.7920

Standard errors in parentheses.  
\*\*\* Significant at the 1% level.  
\*\* Significant at the 5% level.  
\* Significant at the 10% level.  
<sup>†</sup> Significant at the 20% level.

**Table 10: Direct Sold Plans Fixed Effects Regression**

	Coefficient	Standard Error	t-ratio
<b>Dependent Variable:</b> Average Portfolio Expense Ratio (bps)			
State Tax Deduction Dummy	-8.57	16.85	-0.54
Potential Benefit for Wage Income	0.03	0.02	1.72
Potential Benefit for Interest Income	-0.85	2.26	-0.38
Plan Age	-3.28	1.03	-3.19
Year 2003 Dummy	-2.60	5.81	-0.45
Year 2004 Dummy	3.01	6.09	0.49
Year 2005 Dummy	-1.45	6.51	-0.22
Year 2006 Dummy	-5.85	6.48	-0.90
Log of Number of State Households	-4.12	31.17	-0.13
Log of State Population Under Age 18	-2.81	31.73	-0.09
Number of Competing 529 Plans in State	-2.64	2.82	-0.94
Intercept	170.08	23.02	7.39
Observations	123	Within R-squared	0.2807

## 5 Conclusion

Some initial studies find a positive relationship between 529 plan participation and fees, suggesting broker marketing efforts are significantly affecting 529 participation rates. While I do find a positive and significant relationship between broker sold plans and participation, I find no significant relationship between participation rates and fees. However, when investigating the tax incidence with respect to 529 plans, I find a positive relationship between certain state tax rates and 529 plan fees. Given investors have an added incentive to participate in a particular state's plans due to that state's tax incentive, fund companies seem to be setting plan fees to be correlated with these incentives. Thus, mutual fund companies seem to be trying to extracting economic rents from uninformed consumers who do not realize that they can invest in any state's plan.

## Appendix

### A Description of Variables Used in Analysis

- Plan Type Variable - A variable that has a value of 1 if the plan is sold directly to investor, has a value of 2 if the plan is only available through a broker and has a value of 3 if the plan is a prepaid program involving the purchase of tuition credits or certificates that entitle the beneficiary to a waiver or payment of future qualifying college costs.
- Minimum Expense Ratio - The minimum possible fees charged as a percent of assets in the individual investor's portfolio.
- Maximum Expense Ratio - The maximum possible fees charged as a percent of assets in the individual investor's portfolio.
- Average Expense Ratio - The average of the minimum and maximum possible fees charged as a percent of assets in the individual investor's portfolio.
- State Tax Deduction Dummy Variable - A dummy variable that is given a value of 1 if the plan's state allows a state tax deduction for contributions to the plan and is set to 0 otherwise.
- Fixed Population Tax Rate on Interest Income - The state tax rate on interest income assuming only tax rates varied across time and state, but households were held constant.
- Fixed Population Tax Rate on Dividend Income - The state tax rate on dividend income assuming only tax rates varied across time and state, but households were held constant.
- Actual Household Tax Rate on Interest Income - The actual average marginal state tax rates on interest income assuming household characteristics and state tax rates vary across time.
- Actual Household Tax Rate on Dividend Income - The actual average marginal state tax rate on dividend income assuming household characteristics and state tax rates vary across time.
- Number of Households in Each State - The number of households in the state according to the 2000 U.S. census.
- State Population Under Age 18 - The population of individuals under 18 in the state according to the 2000 U.S. census.
- Number of Competing 529 Plans in State - The total number of 529 Plans available in the state.

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